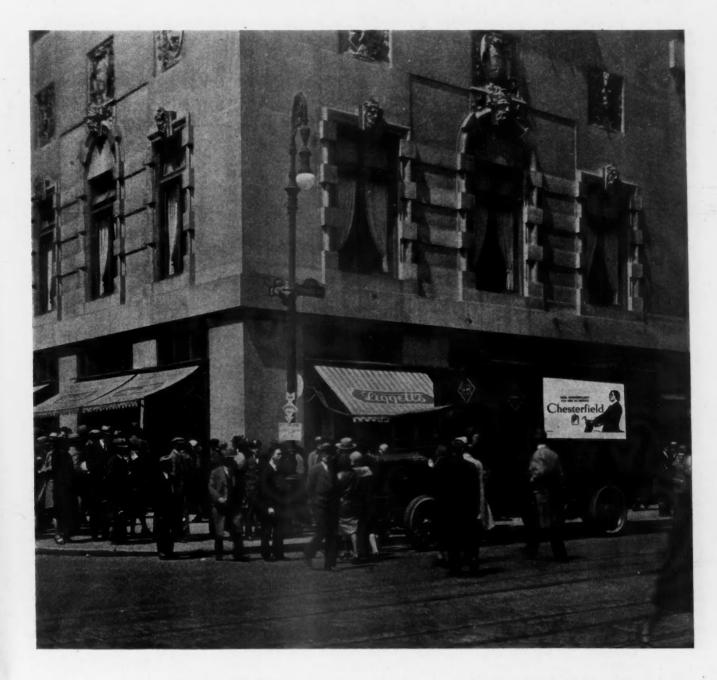
COMMERCIAL CAR JOURNAL

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NO. I



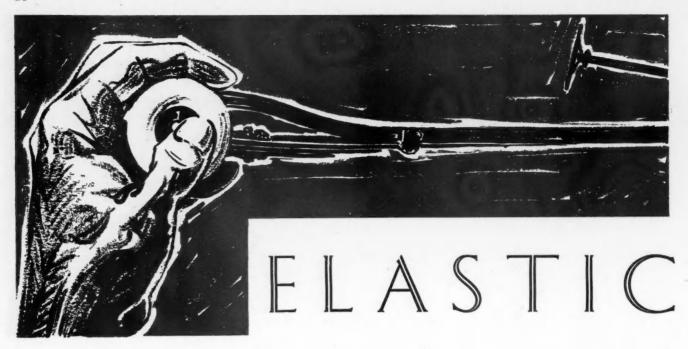
LOOK!

ADVERTISING'S greatest medium is that which reaches out everywhere, penetrates the most exclusive circles and conveys its message directly to the greatest number of people. Quick to seize and requisition for their service all proved vehicles of expression, advertisers of nationally known products post their bills everywhere, along highways and railroads, high on city buildings, on country barns, in shopkeepers' windows and even in the sky.

And now they are coming to a new medium, unquestionably the greatest of them all—trucks. Billboards are stationary and their effectiveness limited—trucks are mobile and their reader scope

Immeasurable. And besides, trucks are alive, they pull attention. Flashing up and down the highways, reaching into every nook and cranny of human activity and rushing into localities where bills of the conventional kind are taboo, trucks are ever on the Job. Astute national advertisers have come to recognize the truck as the king of out-of-doors billboards and are willing to pay a good price for the privilege of using space on them.

All of which seems to prove that the operator who isn't exploiting this valuable space to the fullest advantage is dumping overboard an asset that others are willing to buy for good American dollars. Read on page 18 what others say.



"YES!" SAYS OPERATOR

James C. Bennett, Associated Oil Co. San Francisco, Calif.

HE operator who is fully alive to his problem realizes quickly that, from the viewpoint of revenue and possible profit, a truck continues as an asset only so long as its wheels are turning. The moment they stop, the vehicle is transformed from an asset to a liability. Hence, one of the first goals of the operator is to keep a truck continuously in service.

Four years ago common experience was that a truck must be withdrawn from service for 30 days, and possibly for 45 days in the year, for periods of general reconditioning. The common practice also was to withhold a truck from service for 15 to 25 days for purposes of repainting.

During the first six months of last year the average time out of service for a fleet of 760 trucks was one day out of each 45 calendar days for each truck. This included the time required to repair because of accidents and for repainting, in addition to the normal reconditioning of the vehicle. Largely through the use of exchange units, such as engines, transmissions, rear ends and generators, we have almost eliminated the periodic overhaul.

Use of exchange units offers a tremendous advantage in terms of operating time to be gained. Assurance that all units in trucks of a given weight-carrying capacity shall be interchangeable, not only today but perhaps for some years to come, becomes highly important to the operator.

If the manufacturer, as distinguished from the assembler, of trucks, and particularly the producer of trucks of long potential life, is to look forward to favorable consideration by the operator whose use of trucks necessitates a comparatively short mileage life and hence early obsolescence, he apparently must incorporate provision in his truck that will enable the purchaser to modernize that truck in due time without a disproportionate outlay for the unit of later design.

Many of us today are operating trucks that are fitted with fourcylinder machines, which might easily be stepped up to meet the present-day demands, particularly with reference to speed. Would

TURN TO PAGE 52, PLEASE

The Affirmative

Interchangeability of major units in trucks of same capacity would eliminate periodic overhaul and reduce average time out of service.

Operators should be able to exact full mileage from vehicles by modernizing them with replacement units of later design without great outlay of cash.

Unit interchange would permit operators to purchase long life trucks because obsolescence then would not dictate early retirement.

The need for charging off millions of dollars worth of investments in trucks which have become old could be avoided by unit interchange.



The Negative

Interchangeability of units between chassis made under one roof and assembled chassis is not practicable.

Rejuvenation of old equipment by replacement of old for new units will not pay operators.

No one can anticipate space and mounting requirements of future units for replacement purposes.

Changes in one unit may throw complete assembly out of balance and alignment.

Manufacture of a chassis of given capacity for long or short mileage life is impracticable from engineering and production standpoints.

ENGINEERS SAY "NO!"

A. W. Scarratt, International Harvester Co.

NTERCHANGEABILITY of units in a large fleet operation is highly desirable. I do not think it has been accomplished to any great extent up to this time as between competitive makes of trucks, but it is only natural that in a large operation, interchangeability of the major units is of great help in keeping the fleet on the road the maximum amount of time. However, I doubt very much, with the major portion of the chassis, the product of a large truck manufacturer who has his own distinctive units, that there can be much interchangeability between chassis of that character and the more or less assembled makes of chassis.

As to the rejuvenation of old equipment, to modernize it and make it of higher earning capacity, I doubt very much that in the long run extensive alterations to the old-type vehicles will pay. When you start to rejuvenate an old-model chassis, you hardly know where to begin, and if you do begin you hardly know where to stop. If you put a six-cylinder

engine in a job originally equipped with a four-cylinder engine, the chances are that you will have to make rather extensive alterations around the forward part of the chassis. It is not likely that there will be room enough lengthwise to accommodate the six-cylinder engine. Changes to cooling system, water connections, hook-up to transmission, fuel piping, wiring, and all those things go with it.

If increased speed and flexibility of operation is the object, the six-cylinder engine naturally would have to be a more powerful unit. Then the question arises as to whether the transmission is going to be adequate. Gear changes will become a part of the program, and finally wheels and tires, and last but not least, brakes. It is not easy to put modern brakes into old equipment.

G. P. Anderson,

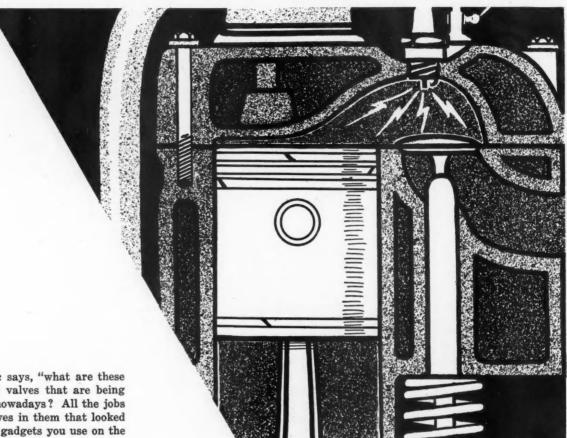
Chrysler Corp.

F we could only ask the engineers to design to a definite mileage and so construct a vehicle that at the end

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ENGINE DIFFERENCES

1



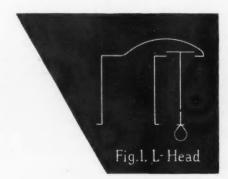
EN," Mac says, "what are these bell and tea-head valves that are being used in engines, nowadays? All the jobs I've had, had valves in them that looked like those rubber gadgets you use on the waste outlet in the bathtub when the darn thing gets stopped up."

"That doesn't refer to the valves themselves, Mac," we replied, "but to the way the valves are arranged. Here is the idea. You've got to have a valve to let air and gasoline into a cylinder, and another valve to let the burnt gas out again. You've got to provide a way to open and close each of these valves at the right time, to keep them from getting too hot, and to oil the valves where they rub against other parts and to oil the parts which work the valve.

"Any number of different kinds of valves can be used. There are sleeve valves which ride up and down inside the cylinder like those detachable cuffs you used to wear when you got all dressed up. They have slits cut in them which match up with holes in the cylinder block when it's time for the exhaust to retire or when the cylinder is ready to invite another mixed party of air and gasoline to inspect its internal arrangements. Then, of course, there are poppet valves, which you so aptly described before, and which are used in the great

majority of truck, bus, automobile and airplane engines. They generally travel in pairs; one for the exhaust and one for the inlet, but sometimes a couple of valves are used to do each job. I'll come back to that later.

"Let's suppose now for the sake of no argument at all that two poppet valves are going to be used. Here are some of the ways you can arrange the valves (as Mac might be confused by an ordinary mechanical drawing, I made the sketches real simple and plain). The arrangement in Fig. 1 we call an L-head because the combustion chamber and cylinder together look like an inverted capital letter 'L.' It's the simplest way of placing the valves and opening and closing them. You can see that the cams on this shaft lift the valves through short push rods. The valves don't open into the cylinder but into a sort of front hall extension of it. In modern engines, all of the working parts are entirely inclosed and they are lubricated by oil fog from the crankcase. This is the most popular arrangement of all,



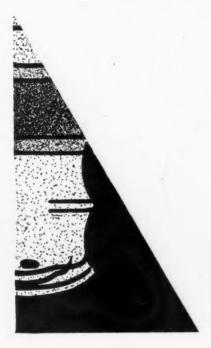
The Commercial Car Journal

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BEGIN IN THE HEAD

Mac Learns How to Determine Engine
Types by Head and Valve Structure

By Athel F. Denham



especialy in the smaller size engines. "Now this arrangement, Fig. 2, is what we call 'valve-in-head.' Here the valves are put in head down, opening directly into the combustion chamber. They are operated through push rods and rocker arms. The thing looks a little complicated, because of the rocker arms and push rods and the cover for inclosure

of these parts. Let's notice that the engine designer can put the valves right over the piston, if he wishes, and then make the combustion chamber any shape he wants to. Another, and an important advantage, of the overhead valve, is that all of a carbon and valve job, except scraping carbon off the pistons, can be done at the work bench. By using a spare cylinder head carbon and valve jobs can be turned out in not much longer time than it takes some speech makers to stop talking after they are through.

"There is another way of operating valves in such a layout and that is by putting the camshaft above the valves. We drive the shaft by a chain and throw away rocker arms and long pushrods. This puts all the valve mechanism in the cylinder heads and overcomes trouble due to expansion of the cylinder blocks when they warm up, which may change clear-

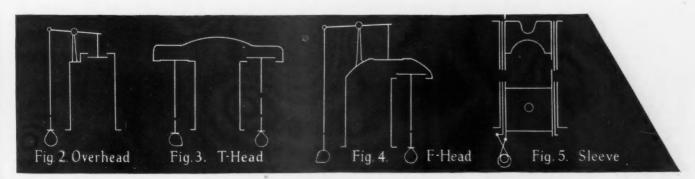
ance between end of the valve and the part which moves it, as in overhead valve engines with push rods.

In this sketch, we've got what we call a T-head design (Fig. 3), cylinder, combustion chamber and valves looking like a big 'T.' It isn't used very often except in big engines nowadays although it was once quite popular in passenger cars. As used now, there are two valves on one side of the cylinder for exhaust, operated from one camshaft and on the other side of the cylinder there are one large or two small valves for the inlet, operated from another camshaft. The reason for using two small valves rather than one large valve is that it keeps the weight of the valves down and also makes them cool better. Heat inside a combustion chamber is enough to melt valves if they were not cooled. A valve cools itself while it is down on its seat and it also gets rid of a lot of heat through the stem. So, you see, the smaller a valve is the easier it is to cool it."

In the meantime, we had been sketching an F-head (Fig. 4) arrangement and having finished this, proceeded to explain the idea to Mac.

"This is one of the ways in which you can combine an L-head and valve-in-head

TURN TO PAGE 76, PLEASE





TRUCKS ARE ADS AND

If the following statement to a group of fleet-operating beverage bottlers by S. E. Travis, Jr., vice-president of the Weldmech Company, is correct . . .

HE problem of sending the public to the dealer is 100 per cent yours. If you don't get Mr. Consumer to the dealer with your product on the time of his

is 100 per cent yours. If you don't get Mr. Consumer to the dealer with your product on the tip of his tongue, you have failed to make a sale. You all must be doing this, but how are you doing it? By advertising? Certainly . . . that is a foregone conclusion. I take it you are using some, maybe all, of the conventional types of advertising . . . newspapers, metal signs, posters, attractive dispensers, school children helps, motion pictures, premiums, but why enumerate the thousand and one different mediums of advertising? . . . you know them all better than I do. But more than half of you are either overlooking or neglecting the most powerful merchandising medium which ever has been, or ever will be, available to a bottler. What am I talking about? I'm pointing my finger at you and telling you I mean your delivery equipment.

Can you buy advertising space on Park Avenue or downtown Broadway in New York? You can put a truckload of beverages there.

Can you buy advertising space on Commonwealth Avenue in Boston? . . . You can put a truckload of beverages there.

TURN TO PAGE 20, PLEASE

And Express Motion Poster Service, Inc., proves its correctness by getting paid for ads on Railway Express Agency trucks with this sales appeal

XPRESS MOTION POSTERS provide advertising in action everywhere.

They appear in all avenues of trade.

They furnish eye level advertising that everybody sees.

They give every advertiser a full front page in color.

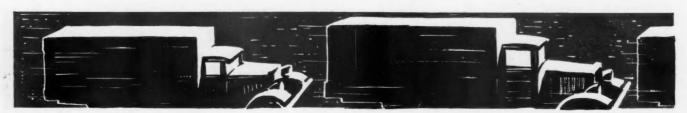
They reach every class of buyer in every neighborhood.

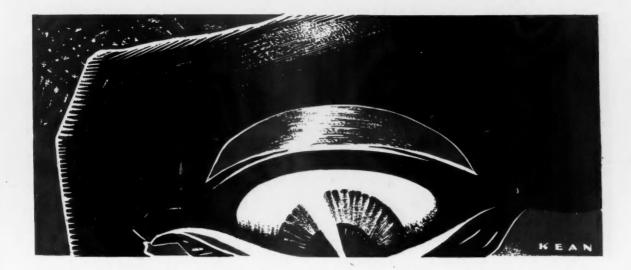
Circulation: The Express vehicles are seen: By the readers of all the newspapers; by the readers of the magazines; by everyone who sees the billboards; by the classes and masses; by people of every political and religious belief; by men, women and children; by motorists, car riders and pedestrians.

Mass and Class: Express Motion Poster Service is Mass Appeal because it reaches all the people—the Times Square, the Broadway, the Fifth Avenue and the suburbs of every city are serviced by the express vehicles.

It is Class Appeal because the art and poster work is high grade, but still more important because the area of circulation includes the fine

TURN TO PAGE 20, PLEASE





ADS PAY

Then why shouldn't this idea, as advocated by Charles H. McBurney, superintendent of Motor Transportation, Marathon Oil Co., be adopted?

URING the year 1929, \$1,000,000,000 was expended in the United States alone on advertising in newspapers, magazines, billboards, electric signs, etc., and out of this enormous expenditure, no allowance was made for advertising on automotive equipment.

The fact that the majority of companies use their automotive equipment as a means of advertising their products is sufficient to show that it must be considered a good means of advertising, and while it is not recognized as such in our budgets, let us compare it with various other kinds of recognized advertising:

Let us take the billboard first. As you know, these billboards are constructed at points in cities and along highways so that same can readily be seen by pedestrians and travelers. Statistics show that the cost of advertising on these billboards runs from \$100 per sign per month to as high as \$1,500 per sign per month, the price, of course, being based upon the size of the sign, the location, and the condition in which the contract provides the sign must be kept.

Now, we have automotive equipment that is continually traveling around, through our cities But is the expense of keeping up the appearance of truck equipment charged to advertising or to operation? Here are some facts and a logical conclusion

and out over our highways, being seen by numberless pedestrians and travelers. In order to preserve the material in that equipment it is only necessary to give it a good coat of some kind of paint, but as it is continually moving among the people upon whom we depend for the sale of our products, with a very little additional expense we can attractively paint and letter that equipment so that each unit becomes a traveling billboard. Does it not seem logical that this billboard moving from place to place is more valuable as an advertising medium than a stationary billboard would be?

The cost of attractively painting and lettering a piece of automotive equipment would vary from \$60 to \$250, but this amount would be trivial as compared with what is paid out for billboards, and the returns on such investment would undoubtedly equal the returns on a similar outlay for billboard advertising.

No doubt the argument will be presented that a truck after being out a short time will become dirty and badly worn, giving a very poor advertising value. Admitting that this is true, it must be conceded that the advertising value is sufficient to warrant the small additional amount necessary to keep

TURN TO PAGE 20. PLEASE



TRUCKS ARE ADS

Charles H. McBurney Asks:

CONTINUED FROM PAGE 19

the equipment freshly painted and lettered at all times, the cost of which would be slight as compared with the expense of billboard advertising.

Automotive advertising cannot be classed with electric sign advertising as a whole, but it has one feature of an electric sign; that is, it is a sign in motion, and it is a recognized fact that a sign in motion attracts more attention than an immovable sign; therefore, an attractively painted and lettered piece of automotive equipment should have its place in recognized advertising, ranking in value between the electric sign and the billboard.

Inquiry among various operators of automotive equipment does not disclose much, if any, question as to the value of advertising on automotive equipment, but the real issue involved is the fact that the cost of this advertising is carried as an automotive operation cost instead of being carried as an advertising cost. This method of handling the cost, in many instances, is responsible for the very poor condition into which the paint and lettering on some units is permitted to deteriorate.

There is no question that in the end this cost is figured into the "per unit cost" of the article or product advertised. However, if it were carried through under its proper charge, undoubtedly more value would be secured out of this method of advertising, for the reason that as long as this cost is charged to operating expense, the operating department will naturally neglect the appearance of the equipment in order to keep their operating costs down, while if such costs were set up as an advertising item, the unit would not be allowed to lose its attractiveness.

In many cases companies feel that it is good advertising to have the cars used by their salesmen painted with company color schemes and monograms. This method of advertising, while good from a sales viewpoint, has its bad feature in that the company sacrifices the cost of a repaint job when the unit is disposed of, and the question is raised as to whether the value of this method of advertising is sufficient to offset the loss sustained when the unit is traded in. Assuming that advertising on automobile equipment is equal to other outside methods of advertising, and considering the length of time such equipment would ordinarily remain in service, it would seem that the loss sustained in the trade-in is well warranted.

Undoubtedly the additional expense incident to the use of automotive equipment for advertising purposes will bring some discussion from the automotive operating departments, as this additional cost of painting and lettering, under the present distribution arrangement, would tend to increase automotive operating expense (as such costs are now being wrongfully charged to that account), but:

Since our companies spend thousands of dollars perfecting trademarks and trade names, why not take advantage of the advertising medium provided by the road equipment we must of necessity maintain, and use it to help in keeping before the public these trademarks and trade names, letting the expense involved be absorbed where it rightfully belongs—in the advertising budget.

Express Poster Service Does:

CONTINUED FROM PAGE 18

sections of cities where no other display advertising is available.

Reiteration: Each Express truck every day traverses a different route and in many cases this route is covered several times daily. This systematic demand for attention creates reiteration to a high degree and makes E.M.P.S. advertising an outstanding value.

Effectiveness: E.M.P.S. advertising

is effective because the advertising is brought to the consumer.

It is not necessary to pass a certain poster location—Railway Express trucks bring every E.M.P.S. advertisement to the attention of the public.

Concentration: E.M.P.S. advertising has no waste circulation, because the trucks are always traveling in the avenues of trade, serving both industrial and residential territories. There is no dissipated circulation.

S. E. Travis, Jr., Says:

CONTINUED FROM PAGE 18

Can you buy advertising space in the business section of any American metropolis? No! No matter how much money you have, you can't; but . . . you can put that truckload of beverages through that business section as many times as you want to.

Now let's get down to brass tacks. If circulation means anything in advertising, and the newspapers tell you it does, the poster people tell you it does, the motion-picture people all tell you the same thing, and the price you pay is based on circulation . . . if circulation means anything, what have you to offer to compete with attractive and distinctive delivery equipment?

I just made the statement that half of you were losing sight of the importance your delivery equipment can play in merchandising and advertising. If I were to make a similar statement regarding the bottling industry in general, I would stretch that considerably. I would say that 90 per cent of the bottlers in this country are operating in blissful ignorance of this factor, and I would base this statement on the personal observation of members of my organization in visit-

TURN TO PAGE 50, PLEASE

What is a Truck Ad Worth?

More than \$25,000 a week is the potential value of space on the truck sides of the 8500 unit fleet of Railway Express. Space, according to "Advertising and Selling," is sold at the rate of \$3 per week per truck for two or four-sheet posters, measuring 46 in. high by 60 or 120 in. wide, by Express Motion Poster Service, Inc., 1465 Broadway, New York City.

S. Dalsimer & Sons, Philadelphia, welcomes the opportunity to buy space on trucks for advertising display purposes. This company has succeeded in buying such space from four different truck owners, using it to advertise its service and product. The other parties to the contract were operators who had no great need for the space and were willing to let it go for \$100 a year plus cost of keeping the trucks painted.

Geo. B. Bains & Sons, another Philadelphia concern, considers one truck with advertising display more than twice as valuable as one billboard and on this basis saves itself \$140 per month. For every new truck added to its fleet this company eliminates two illuminated billboard ads for which it paid \$70 per month.



LEGISLATIVE HALLS GRIND NEW BATCH OF TRUCK BILLS

ORRY the trucks and make 'em pay, worry the . . ."

So do the sounds shape themselves as one listens to the rhythmic whir of legislative machinery which is now going full blast in every State except Kentucky, Mississippi, Louisiana and Virginia.

Within ninety days most of these law mills will have stopped after putting on the statute books a small proportion of the 2500 to 3000 automotive bills which will have been introduced.

It's too early to guess very closely which bills affecting trucks will eventually be passed, but late information does indicate a few general trends.

Marked shortening of length limits for trucks and truck-trailer trains is being strongly agitated, and some of these new restrictions will become law. Width restrictions are being proposed also, but are getting less attention than length this year. Increases in gas taxes seem likely to be numerous, with proposals running as high as 8 cents per gallon in two states.

Compensation insurance laws, somewhat similar to the law now existing in Connecticut and several other states, are getting strong support

Some Are Harsh and a Few Are So Much Boloney, Which Is Harder to Digest If You Find You Must Stomach It

in a number of states, but straight compulsory insurance legislation of the Massachusetts type is finding fewer advocates than formerly.

Pressure is strong for more weight restrictions, but less furore about truck speeds appears than might have been predicted.

Attempts to hamper operation of all motor vehicles for hire with regulatory measures are numerous and vigorous; many will be successful.

The whole automotive industry, it is clear, has need for conducting a consistent, regular educational campaign for the proper economic and technical regulation of motor vehicles if it is to save,

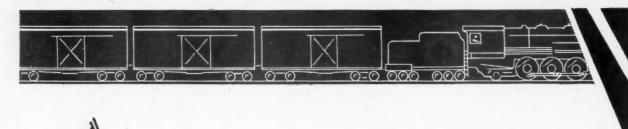
for the people of the United States, the economic and financial benefits which can accrue to them through wider and more intelligent use of motor transportation.

Following is a digest prepared by the Motor Vehicle Conference Committee of some of the bills introduced:

TRUCK REGULATION AND TAXATION

Arkansas, H 165—Imposes 3 per cent gross receipts tax on all property carriers "for hire."

California, S 135—Provides for TURN TO PAGE 60, PLEASE



TTIRING ourselves in the glowing mantle of Elsie Dinsmore, and striving for the calm, ingenuous introspection of "Alice in Wonderland," we sallied forth, one day recently, to discover what, if anything, the shipping interests thought about the current transportation war raging between railroads, truck operators, and those with freight to "ride."

We desired light, and a lot of it, on just what "all the shootin' is about" from the shipper angle. We craved to know why the railroads were emphasizing the carnival spirit and begging staid Interstate Commerce Commissioners to regard trucks and buses as ha'penny stalls and urging them to "'it the Ethiopian in the eye with a legislative baseball, and get yourselves a good cigar." In short, we wanted shipper views in plural quantities—not for ourselves, but for the readers of COMMERCIAL CAR JOURNAL.

, • From Headquarters •

W ITH the foregoing in mind, therefore, our first and last stop in the search for transportation knowledge was in the office of William H. Chandler, traffic manager of the Merchants' Association of New York, and chairman of the Shippers' Conference of Greater New York.

We bothered Mr. Chandler specifically because, as the statesmen say before naming their candidate, "he, more than any other man on God's green footstool," speaks his mind on railroad sins of omission and commission, frequently accomplishing spectacular results in the process. We launched into our interview by asking Mr. Chandler if he knew the railroads' plans on store-door delivery.

"I am unable to obtain any statement from anybody about that," returned Mr. Chandler. "I have been given to understand that, at the request of the Committee of Traffic and Operating Vice-Presidents, the Railway Express Agency is making a survey of the subject, confining their study to New York. Further than that, I can only say, 'There is much excitement, but I can learn nothing startlingly definite.'"

"Is that characteristic?" Mr. Chandler was asked.

"A leading question," replied the traffic authority. "All I know is that it's time the railroads did something to reduce costs for the shippers. First we had inland stations in the port of New York, and still have them, although the railroads want to discontinue them now. Then, we had constructive station operations, and this type of delivery was wiped out when the trucking dog wagged the railroad tail. At the January hearing, held to take testimony on the 'need' for reverting to pier deliveries, railroad spokesmen were positively plaintive in their desire to do away with the one indication of coordinated freight movement shown to date. And each time a demand for store-door delivery is stressed, the carriers become abysmally deaf.

"But don't think," Chandler went on, "that the carriers blame themselves for their decreased earnings. They don't! Instead, they blame trucks, passenger cars, buses and everything else but themselves. Have you seen this?"

Mr. Chandler inquiringly held aloft a blue pamphlet issued by the Association of Railway Executives. The pamphlet proved to be a Turn to page 37, please

"Spokes" from the Spokesman

Two things have entrenched motor trucks in the transportation field: first, service and rapid delivery; second, early refusal of railroads to meet demand of short-haul-less-thancarload traffic.

Railroads should stop complaining, stop their propaganda, stop their misrepresentations and direct their efforts toward a solution of modern shipping needs. Perhaps the answer is store-door delivery, truck-coordinated rail operation and joint rates, but on a wholesome and not cut-throat basis. Truckers and shippers will not, can not be sacrificed.

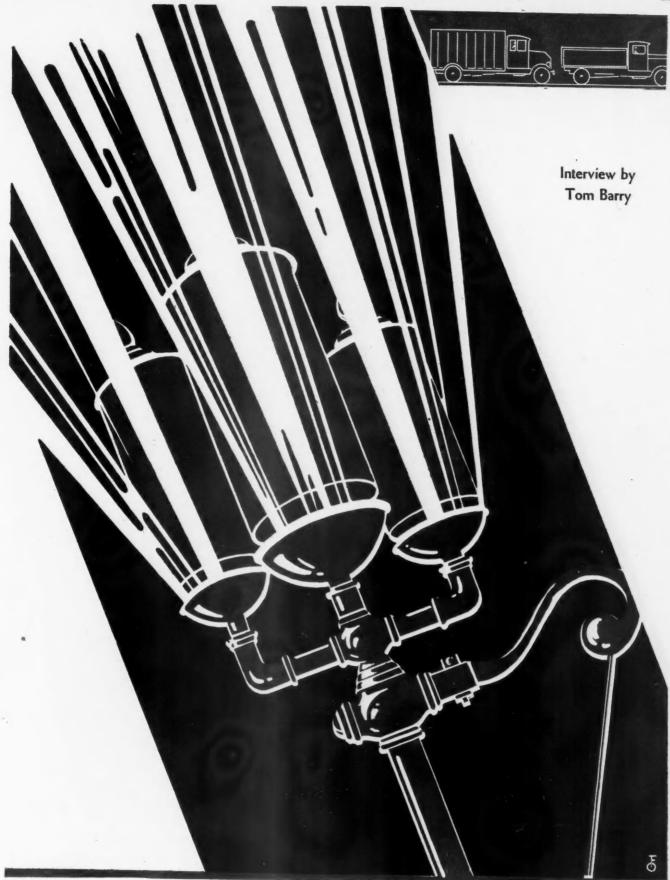
The Spokesman



W.H.CHANDLER Traffic Mgr. Merchants' Ass'n of N.Y.

A SHIPPERS' SPOKESMAN





WARNING TO RAILROADS

The Commercial Car Journal

March, 1931

AFTER HOURS

We Venture an "Informative Bid" in the Rail-Truck Legislative Tangle

LL along the legislative front, measures to throttle the economic effectiveness of the motor truck are being hurled into the state houses and senates. Along with them is being laid down a barrage of bills designed to make the truck pay more while conditions for its earning income are made less favorable. The truck is now in the process of taking its regular bi-annual lacing from the legislative solons.

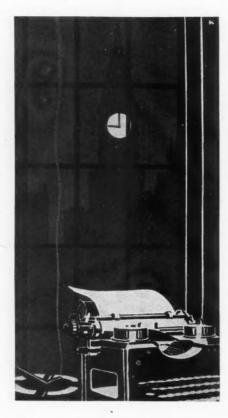
And why?

Largely because of vigorous antitruck activity on the part of railroads; partly because the truck industry itself has not yet been able to focus upon a positive program for sound technical and economic regulation sufficiently definite to permit interpretation in vital, simple language to the average state legislator.

The whole agitation for restrictive regulation and excessive taxation of motor vehicles in general and motor trucks in particular has come almost exclusively from competitive sources. Demand for regulation has not come from the business world which uses the truck nor from consumers of products which are transported by trucks.

As pointed out by Larue Brown and Stuart Scott recently, the fact that the demand for regulation comes almost exclusively from the railroads "is apparent from the most cursory examination of the testimony thus far presented in the nation-wide investigation comprised in I.C.C. hearings, Docket 23,400. Such shipper testimony as has been advanced has been opposed to regulation."

Thus far the railroads have succeeded in dramatizing their case before state legislators more vividly than has the truck industry. The materials with which they have had to work have lent themselves to dramatization much more readily than have the sound, logical presentations drawn from analysis of facts and experience data upon



which the case for the truck has necessarily rested.

Until recently, too, only those who have followed legislative trends rather constantly have been entirely alive to the distressing results which will accrue to fleet owners. dealers and manufacturers if current tendencies continue. An aroused shipper opinion, crying clearly for the rights of individual businesses to have available economical transportation seems almost certain eventually to exert itself potently. And in stimulating, informing and helping this shipper and truck owner opinion, practically every truck dealer and salesman, as well as every fleet owner, can play an active and constructive part. Read article on page 22.

Truck dealers and salesmen should equip themselves with enough knowledge about current legislative activities and trends to enable them to talk intelligently and informatively concerning these factors with everyone whom they may contact.

The current legislative battle is at white heat as we write. Only a few of the 3000 automotive bills being introduced into 44 state legislatures, of course, will be made into law this year. It is to be hoped that some of them will pass, because certain measures are designed to help the economic development of motor transportation. Sound thinkers in the industry, moreover, are in no sense opposed, per se, to added legislation concerning truck regulations and taxes; but they are intensely interested in the promotion only of legislation which will lead to proper economic and technical regulation and taxation of motor vehicles.

A good share of the bills now being proposed, however, cannot be interpreted in this latter category by any stretch of the economic imagination. It's too early yet to say just how much damage will be done in 1931 to the chances for sound economic motor transport growth, but there is every indication that it will not be small.

Through the Motor Vehicle Conference Committee fine, consistent work has been carried on for many years in gathering and disseminating information on legislative matters, while the motor truck division of the National Automobile Chamber of Commerce has been effectively active along general educational lines. Both of these forces are functioning vigorously in the interests of the whole truck industry at the present time, with the effort by the N.A.C.C. to help organize truck owners' associations an outstanding feature of current activities. Through support of the efforts of these existing agencies, the individual dealer, salesman and manufacturer can help the sound economic development of motor transport .- N.G.S.

TRAILER SENSATION of 1931

FRUEHAUF

Announces

NEW and BETTER PRODUCTS AT LOWER PRICES . . . THE GREATEST VALUE IN TRAILER HISTORY

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FRUEHAUF TRAILER COMPANY

Branches and Distributors in All Principal Cities



FRUEHAUF TRAILERS

"Engineered Transportation"



ERE is a vocational study of how a wholesaler can use motor trucks to cover his territory thoroughly and increase his sales volume.

It is written by a wholesaler, who tells truck dealers and salesmen all they need know in order to approach prospects in this vocation with an intelligent presentation. The author is an automotive jobber, but, as he points out, wholesalers in other lines of business have virtually the same sales problems as he has.



MOTOR TRUCKS HELP JOBBERS

SQUEEZE OUT

At the present time we are traveling six supply trucks from our general office and warehouses in San Antonio and company branch in Corpus Christi, Tex. These trucks serve about 1500 southwest Texas retail outlets within a radius of 150 miles of San Antonio.

Traveling demonstration trucks are now no innovation, at least they are not new to the automotive trade, but so far as we have been able to gather, we were the first automotive jobbers in the Southwest to install a fleet of trucks that sell from town to town as our trucks do. When we began this method of merchandising back in 1925 the sea was uncharted, and the technique of supplying automobile dealers and garages with replacement parts directly from trucks was an equation that we had to work out in our own way.

These vehicles of ours are not demonstration trucks such as have been employed by many automotive whole-salers in introducing shop equipment, for instance, to the trade. They are traveling stores with a competent salesman in charge of each truck. Each truck is a merchandising unit, complete in itself. The salesman carries a selected line of standard replacement parts on his truck. He sells entirely at wholesale to retail outlets, and he sells for cash. These are some of the general features of our merchandising set-up, which is now fairly well known by the trade.



MORESALES

Upon the invitation of the editor of The COMMERCIAL CAR JOURNAL, I am glad to present the main details of our system with the hope that they may be of some value to wholesalers of small goods in other lines than ours who may be contemplating the direct merchandising of their commodities through the addition of traveling stores. Replacement parts and most of the items that we stock on our trucks are what are commonly classified as small goods. It is conceivable, I think, that other small goods could be wholesaled in a thoroughly practicable and profitable way directly from trucks. Such wholesalers as those serving the barber and beauty shop

trades, laundries, shoe repair shops and so on, are some, it seems to me, who might find trucks of advantage in placing their small goods in the shops and workrooms of their customers.

But before proceeding further, let me caution any wholesaler to consider carefully his own particular problem before launching out in a direct merchandising campaign through the use of traveling stores. It is with

Facts and Opinions by



FRANCIS J. BOWEN, JR. Pres., Bowen Bros., Texas

The Commercial Car Journal

March, 1931

TRUCKS HELP JOBBERS SQUEEZE MORE SALES

the view of not emphasizing this method of selling small goods too strongly that causes me to be conservative in recommending it.

Most business men wish figures when reading of the change from any traditional system to a newer one such as ours is. The editor of the magazine, carrying this article, asks in particular for comparative figures. I am sorry that we have none. As launched five years ago, we were a direct selling concern from the very start. In trying to arrive at some estimate of how valuable the truck method of selling is to us, it seems to me that it is sufficient to say that we believe the trucks have increased our net yearly profits at least 5 per cent on gross sales. Furthermore, we enjoy the decided advantage of having our business on a cash basis.

Besides our six trucks, we maintain counter service in San Antonio and Corpus Christi. We also ship out orders by the usual deliveries, and we have established machine shops in both of our places that do general automotive machine work for those of our dealers who are not equipped to do certain jobs as well as we are. But underneath all of this superstructure, our business rests upon the foundation of selling directly from trucks. Perhaps the strongest argument we could offer in favor of our trucks is that we have not thought of discontinuing them.

All sales from trucks are on a cash basis. We have even posted notices to the effect that any salesman who does not secure cash at the time of delivery or who is found delivering merchandise on a promise of payment, is subject to automatic dismissal. And cash means cash to us. If salesmen take checks, they do so at their own risk. We sell no goods on a credit basis to dealers in the territories. Our cash system has been in use since 1925, and has been generally satisfactory.

The question has been asked, "What unfavorable experiences did you encounter at the outset and how were they remedied?" Our first problem was in educating the trade to pay cash when buying from the trucks. It was somewhat difficult to wean them from their easy-going credit habits. The problem was solved by persistence in showing them the soundness of the truck method, of convincing them of the saving in

transportation costs and the saving in time. Personal inspection of merchandise before buying has done a lot to bring the trade to see the value of putting cash on the barrel head.

We believe strictly in the maintenance of a set system of prices. Each salesman is provided with a catalog and price list, in suitable binder. The prices are fixed and set by the home office on all parts and equipment, and no salesman is permitted to deviate therefrom. Through this system we have got entirely away from the system of bartering.

Salesmen's compensation provides for a reasonable drawing account to cover expenses, plus a commission. A set quota is fixed for each territory, and the compensation of the salesman varies according to his volume of sales as compared with the quota.

Special Body

NOTHER problem that we have had to solve was that of securing a design for truck bodies that would properly display merchandise and make same quickly accessible. After some experimentation, we evolved the design now in use which provides for a body that has panels on each side that can be raised and kept open to display stock of replacement parts in the shelving on the outside of the body. This arrangement makes the stock 100 per cent visible, and serves the same good purpose as stock on open tables does in the 5-and-10-cent stores. Items can be seen easily by the customer; they can be handled by him, and they can be assembled quickly for filling orders. Space within the truck provides for auxiliary



Salesmen of Bowen Brothers, San Antonio, cover a wide territory, selling and delivering simultaneously

stock and also for transporting any pieces of equipment that the salesman may pick up for bringing into our machine shops. With such trucks as these, customers are not troubled by trying to inspect stock in close quarters within the truck itself. When raised the panel sides are out of the way, and they provide shelter against the sun and rain. The driver-salesman has comfortable quarters in a closed cab with ample glassed-in space to make vision easy in driving.

Replacement parts are not such beautiful items in themselves, but they look well when boxed, and we impress upon our salesmen the value of keeping their stock in clean and neat order at all times. The trucks are inspected and gone over every two weeks when they come in from the territories. So that they may present a good appearance at all times, they are repainted every six months, and they are completely overhauled once a year. All minor repairs, made on the road, are stood by the salesman, who also pays for the gas and oil. Overhauling and cost of tires are met by the company.

The truck bodies are made for us in San Antonio. They cost about \$750 each. The traveling stores, trucks, bodies and all, are owned by the company, and they are not rented to the salesmen.

Items are withdrawn from the warehouse stock for the traveling truck stores whenever needed. All goods for truck merchandising are packed in units of convenient size and kept in stock to expedite loading. As he stocks his truck, the salesman signs for each unit. A physical inventory of the stock on each truck is made every 30 days. This inventory, with the invoices mailed in by the salesman in question during the month, acts as adequate means of accounting for every item that the salesman withdraws from stock.

A perpetual card inventory system is used in keeping track of stock in the company's warehouses. From the stock manager's desk in the center of the warehouse floor, it is easy to check up on counts on the cards through making a physical inventory when such is deemed necessary.

Salesmen are required to make a daily report on a blank, designed for the purpose. This form has columns for the invoice number of each cash sale, name of customer, net truck sale,

TURN TO PAGE 77, PLEASE





THE TRUCK INDUSTRY-FIGURATIVELY SPEAKING

HILE domestic sales in December were still well below the December, 1929 total, as indicated by the statistics below, a percentage comparison reveals the gratifying fact that the drop was only 25 per cent, which is a considerable improvement over the six preceding months. Sales for the year, however, were off slightly more than 28 per

cent from the 1929 total. But here again a bright aspect is seen in the fact that the comparative improvement in December prevented a dip into the thirties.

Production for the year was short 257,540 units, or 31 per cent, of the 1929 total, while exports for the year closed 45 per cent below the 1929 level.

Domestic New Truck Registrations by Makes and Months

	Autocar	Brockway-Indiana	Chevrolet	Diamond T	Dodge	Fageoi	Fargo	Federal	Ford	G. M. C.	Gotfredson	International	LaFrance-Republic	Mack	Moreland	Relay	Reo	Rugby	Schacht	Selden-Hahn	Sterling	Stewart	Studebaker	White	Willys-Overland	Total Sales Including Miscellaneous
January1930 January1929	160 135	249 249	8,754 6,169	242 302	1,608 2,368	41 71	186 169	169 204	13,233 13,019	727 1,178	12 43	1,835 2,158	43 43	345 372	51 60	28 52	698 946	90 103	21 5	30 14	145 101	97 113	104 121	413 412	440 235	30,24 29,37
February1930 February1929	135 129	235 247	10,332 10,288	207 276	1,269 2,009	43 44	152 159	162 190		552 1,022		1,928 1,939	44 68	298 388	29 62	30 39	565 830	67 73	20 5	23	74 87	155 134	91 93	320 339	431 316	31,88 32,56
March1930 March1929	195 230	384 410	13,011 16,062	264 370	1,595 2,632	48 73	157 244	228 262	19,551 17,797	936 1,330	10 22	2,364 2,526	55 52	452 752	56 70	45 47	682 1,240	62 87	27 25	16 21	106 113	265 172	102 210	407 508	559 455	
April 1930 April 1929	216 368	492 518		300 352	1,684 3,054	52 111	153 239	252 286	21,757 22,790		7 16	2,740 3,425	71 52	566 852	57 83	61 121	903 1,475	47 101	47 29	24 33	147 157	314 244	98 159	480 622	564 474	
May1930 May1929	212 335	544 462	12,825 15,965	373 350	1,504 2,847	59 78	152 272	213 326	19,758 22,364	1,191 1,453	14 12		49 150	717 740	36 62	93 76	737 1,547	59 125	55 38	20 31	147 165	305 242	115 149	452 621	456 439	
June1930 June1929	183 229	481 377	9,761 13,234	261 307	1,113 2,418	56 79	118 290	158 229	15,669 19,528	889 1,315	5 6		56 51	446 694	29 58	43 65	581 1,222	54 97	38 33	22 19	109 157	207 171	102 153	412 505	352 474	
July 1930 July 1929	194 306	388 571	10,947 18,056	338 318		47 104	124 478	209 275		882 1,469			50 48	577 692	39 86	41 56	583 1,326	71 132	43 17	11 40	104 177	262 254	88 175	460 564	409 969	
August 1930 August 1929	171 263	251 436	9,544 16,651	277 362	707 2,262	32 63	91 396	142 235				2,223 3,188	51 70	405 646	33 61	27 72	436 1,212	72 135	26 24	19 31	102 176	184 255	85 116	399 598	295 841	
September1930 September1929	171 290	191 348	9,716 15,337	217 268	1,018 2,381	33 46	60 382	155 239	17,531 19,470	622 1,003	5 12	1,827 2,731	63 52	360 481	41 46	25 48	402 1,028	75 120	21 16	12 27	92 96	172 146	102 144	317 487	249 769	
October 1930 October 1929	186 288	265 394	8,485 15,815		1,738 2,645	28 . 61	60 353	174 280	18,155 20,978	678 1,199			58 82	391 623	23 56	30 63		56 116		13 26	91 155	177 206	198 124	321 627	252 764	
November 1930 November 1929	119 241	205 305		137 235	1,243 1,716	31 43	24 220	145 208	11,487 15,550	378 772	5 7		33 45	214 399	8 38	29 39	256 689	38 73	18 24	9	52 101	100 131	258 102	225 443	141 462	
December 1930 December 1929	71 142	105 215	5,407 5,380	121 156	1,008 1,369	14 19	19 173	89 120	9,046 11,258		2 5	935 1341	25 34	176 280	24 44		226 537	27 67	17 26	7 3	58 93	74 96	213 107	192 397	134 320	18,66 23,27
12 Months1930 12 Months1929			118,290 160,892			484 792	1,296 3,383	2,096 2,853	197, 122 223, 405	9,051 14,248	78 189	23,719 31,434	598 815	4,947 6,823		470 713	6,426 12,894	718 1,230	359 280							410,58 526,83

Truck Production

(U. S. :	and Cana	ida)	
	1931	1930	1929
January	33,521	38,557	57,765
February		51,087	65,950
March		66,555	79,587
April		71.238	91,855
May		58,496	94,940
June		48,458	98,164
July		42,099	78,703
August		41,209	59,985
September		44.301	54,683
October		39.678	66,235
November		34,665	50,365
December		32,928	28,579
		569 271	826 811

Foreign Truck Sales

and Canad	1931	1930	1929
January	15,544*	20,282	23,119
February		14,015	30,905
March		19,142	39,872
April		22,721	33,378
May		21,733	28,838
June		15,412	32,170
July		12,611	38,623
August		13,268	29,120
September		13,321	23,084
October		10,868	23,50
November		11,933	19,60
December	****	12,062*	16,70
12 Months Total .		187,368	338,92



By James W. Cottrell

N engine which after stopping on the road for no apparent reason condescends to start again in a few minutes after the driver has lifted the hood and found nothing wrong is a puzzle for trouble shooters. During last summer many shops were called upon to solve this riddle and, unless all signs fail, they will have the same trouble again next summer.

Similar in nature is the trouble with engines which quit idling after a long, hard run in hot weather. The engine pulls very nicely up hill or at high speed on the level, but stops after a short period of idling. As in cases of stopping on the road, engines respond to the starter after the driver has wasted a lot of time trying to find out what is wrong. Sometimes the driver puts in a call for a service car, and he comes in for a lot of kidding when the engine starts up

as soon as the trouble shooter arrives.

Drivers and shop men are displaying no ignorance when they are puzzled by the trouble. It is due to a condition which has engaged the attention of truck manufacturers, service engineers, oil refiners and the United States Bureau of Standards.

Vapor lock, which is the cause of these engine antics, is a term used to denote a failure of supply of fuel to an engine because of formation of vapor or gas in the fuel line, vacuum tank or pump, or the carburetor itself. Vapor is formed when temperature of fuel, at a given point, is above that at which the lighter part of the fuel gives

Cracked Ice for Roadside Parties

An engine which becomes "balky" during hot weather may be the innocent victim of an attack of vaporlock. The engine stops without excuse and starts again without repairs. At times it seems too lazy to idle after a long run.

Vaporlock is a stoppage of flow of fuel to, or through, a carburetor by formation of vapor in overheated gasoline. Part of the heating takes place in the gasoline tank, part in the gasoline line and the remainder in vacuum tank or gasoline pump and the carburetor.

The trouble can be cured.

NEW WAY TO HAVE

off vapor. This temperature varies with different gasoline and, of course, actual temperature in a fuel supply system varies according to operating conditions and temperature of outside air.

The cause of vapor lock, therefore, is heat. If there is too much heat, vapor lock will take place and the engine will stop. After stopping, the system cools off a bit and the engine runs again. The reason vapor lock sometimes takes place during idling after a hard run is that circulation of air caused by fan and for-

ward motion of the truck is suddenly stopped. At this time, engine and exhaust lines are still hot and temperature of the fuel supply system increases.

Both vehicle manufacturers and oil refiners have been blamed for vapor lock. When vapor lock takes place, it may be due to overheating of some part of the fuel supply system, which might be avoided, or it may be due to the fact that the gasoline being used is too volatile. Easy starting requires that gasoline vaporize easily. Demand for easy starting and for freedom from vapor lock are directly opposite qualities in motor fuels.

Gasoline is not a single uniform liquid. Ordinary gasoline is a mixture of several different liquids of a similar nature but having different characteristics. To insure starting, a certain percentage of light volatile fuel is used, a larger percentage is made up of heavier and less volatile gasoline and part of it is heavier than the average.

The lighter and more volatile percentage of gasoline is of importance in vapor lock. This is measured in terms of the temperature at which 10 per cent of a given sample of gasoline will boil. In ordinary production, according to field study by the Bureau of Standards, more volatile fuels are sold in

winter than in summer, done to make it easier to start engines in cold weather and to make them operate better during the warming-up period.

The job of service men is not to design fuel systems nor to supervise oil refineries. Their job is to keep vehicles in their care in operation. They cannot go too far in the direction of choosing less volatile fuels and they are confronted with the practical problem of tracing fuel systems from tank to carburetor to find out what is causing overheating of the gasoline on the way to the carburetor outlet.

The Bureau of Standards recently collected figures showing actual fuel temperature in feed lines of passenger cars, trucks and buses, and results were reported by Oscar C. Bridgeman and Hobart F. White of the Bureau of Standards in a paper before the annual meeting of the S.A.E. in Detroit. Their investigations show that fuel is heated in the gasoline tank, in the gasoline line between the main tank and vacuum tank or pump, in the vacuum tank or pump, and in short line from tank or pump to carburetor.

VAPOR LOCK GIVES A HOT TIME

Tests made at 40 m.p.h. show that of 27 cars tested, average heating above atmospheric temperature taking place in the tank was 18 deg., the average heating up to the inlet of the vacuum tank or pump is 29 deg., heating up to the outlet of the vacuum tank or pump, 41 deg., and to the carburetor inlet, 42 deg. All cars, however, are not average, and the highest temperatures observed are of interest. A temperature of 63 deg. above atmospheric temperature was recorded at carburetor inlet of a run at 40 m.p.h. and temperature during idling after a long run or a hill climb of 86 deg. in the carburetor bowl.

Tests on bus fuel systems showed increase of temperature above atmospheric temperature at the carburetor inlet ranging from 16 deg. in an intercity bus to 90 deg. during idling.

"The temperatures (in a table accompanying the paper) are considerably higher than necessary, and it is felt that much can be done in the way of simple modifications which will go far to reduce fuel-line temperatures to reasonable values." The paper gives some points which should be kept in mind in designing fuel systems and they are of equal value to service men in making changes to overcome vapor locking tendencies in vehicles in use. The recommendations in the paper are as follows:

Antidotes

HE fuel line from the rear tank should preferably be on the opposite side of the vehicle from the exhaust pipe.

If this is not feasible, the fuel line should be run outside of the frame channel and in addition should be insulated from the exhaust pipe.

The fuel pump should be well insulated from the crankcase and shielded from the exhaust manifold.

The fuel pump should be so located that it will get its full share of cooling from the air stream (from the fan and forward motion of the car).

Dealer and factory branch service stations and fleet owner shops interviewed during the course of investigation on vapor lock by COMMERCIAL CAR JOURNAL found a number of remedies for the trouble which are simple and well within reach of any shop.

Vapor lock was caused in one truck by overheating of the carburetor by the intake manifold riser, which its exhaust heated. Using a gasket of asbestos ¼ in. thick between carburetor and intake manifold, as shown at right, overcame this problem.

On a heavy-duty truck, vapor locking was caused by the gasoline line being parallel with the exhaust pipe from rear of the chassis to the dashboard. A service manager found, by experimenting, that moving the gasoline line to the opposite side of the frame cured the trouble.

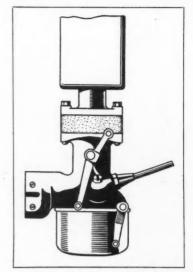
Better circulation of air in the engine compartment overcame vapor lock on another truck. The truck was equipped with an armored steel body, and the drivers complained of heat in the driver's compartment. The service manager placed a metal shield over the exhaust pipe to keep heat from the floor boards and cut out a section of the sheet-metal pan between engine crankcase and frame side-rail to allow air from the fan to escape more easily. This change, which brought about a much greater flow of air from the fan around the carburetor, cured the trouble.

Placing the engine fuel line from the gasoline tank up to the carburetor under pressure instead of suction overcame vapor lock on a bus. Electric fuel pumps were placed as close to the tank as possible, and they pumped the fuel up hill through the pipe to the carburetor. The effect of this arrangement is to put the fuel under pressure and so raise the temperature at which vapor will form.

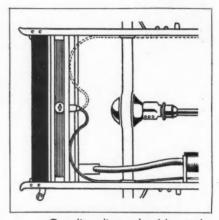
This experience coincides with a statement in the paper to which previous reference has been made, that "it is felt that the introduction of fuel pumps has been more responsible for the widespread occurrence of vapor lock than has any increase in the average volatility of fuels during the last two years."

Several observers report that fuel pumps bolted to engine crankcases reached temperatures as high as 200 deg. Fahr., and this temperature is sufficient to cause vapor lock.

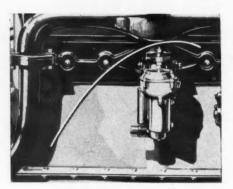
In actual service work it will seldom be necessary to apply all of the remedies for vapor-lock trouble. In most instances the service man will look for the part of the fuel supply system which reaches the highest temperature and take steps to reduce temperature at this point. In extreme cases he may find it necessary to resort to all of the expedients to keep gasoline from becoming overheated on



A thick asbestos gasket keeps manifold heat from carburetor



Gasoline lines should not be placed near exhaust pipes



A shield installed to cause air to sweep over the carburetor

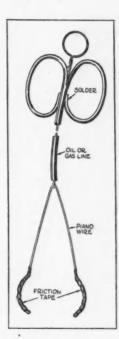
its journey from tank to carburetor. On certain engines the carburetor is very close to either the exhaust manifold or the exhaust pipe and it may be expected that when these parts become red hot that a lot of heat will be radiated into the carburetor itself. In applying sheet-metal shields to carburetors, it must be borne in mind that while insulation from hot metal parts is desirable, the shields must not prevent flow of air around the carburetor.

THE AGONY CORNER



FOR SERVICE MEN

The services of this department, conducted by an expert in truck mechanics, are available to all readers without cost. Send your maintenance problems to The Agony Corner. The solutions will be mailed promptly



Spindle Bolt Break

Wear in the king-pin hole in a front axle was the cause of breakage of spindle bolts, similar to that reported in the January Agony Corner, according the report by George W. Brisbin, auto engineer of the Columbia Natural Gas Co. "To overcome the trouble, we found the only answer to be the replacement of the axle or I-beam," he reports. Wear in the king-pin hole allowed sufficient motion in the drawkey to cause the breakage. He advises the use of the late type king pin which has rounded instead of square-cut draw-key slots.

The wear does not appear to be enough to cause breakage, but any taper from top and bottom of the hole causes heavy strains on the key, which eventually results in breakage at this point.

Before the axle was replaced, this shop rebushed and installed new pins about five or six times. Since the new axle was installed, almost a year ago, there has been no further trouble.

Trailer Rear Warning

When long poles or pipe are hauled on a pole trailer, the ends stick out so far beyond the trailer axle that ordinary tail lights cannot be used. During the daytime a small red flag is hung on the end of the load, but it is no small task to keep these flags at hand when needed.

Both these difficulties are overcome by a combination flag and tail lamp developed by S. C. Phillips, superintendent operation, Sinclair Oil & Gas Co., Tulsa, Okla. The unit, which can be attached to either poles or pipe, is carried on the truck or tractor at all times.

The assembly comprises a piece of steel plate 10 by 14 in., painted red, to which an ordinary tail lamp is fastened. On the back of the plate is a double attachment bracket. The lower part is a sharp triangle with saw teeth on the edges for driving into the end of poles. Above this is a bracket with thumb screw for fastening to end of pipe.

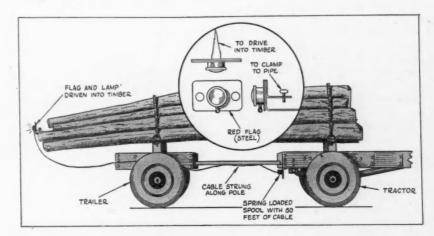
Current for the tail lamp is carried from a spring-loaded reel on the truck. No ground connection is available on a trailer and the line is double with a double socket.

When the trailer is traveling without load the assembly is attached to the end of the trailer. In case the trailer is detached the unit is fastened to the end of the truck frame. Glass Easers

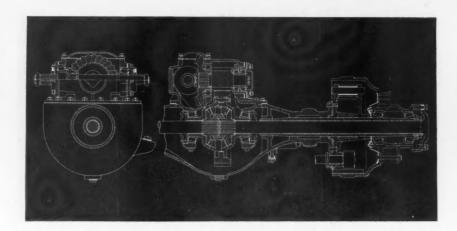
Another Fish Hook

A variation of the fish hook described in the Service Hints page in the September, 1930, issue is used by a fleet maintenance man in Philadelphia for removing broken glass from cab doors. The difference is that the ends of the forked wire are formed in arcs of circles and wrapped with friction tape to give a good grip on pieces of glass. The copper tubing and center wire are the same.

Brightening up the overhang



Through drive on forward axle of double gear reduction unit is provided by placing ring gear outside of the shaft bearing and providing the shaft with two roller bearings and one ball bearing



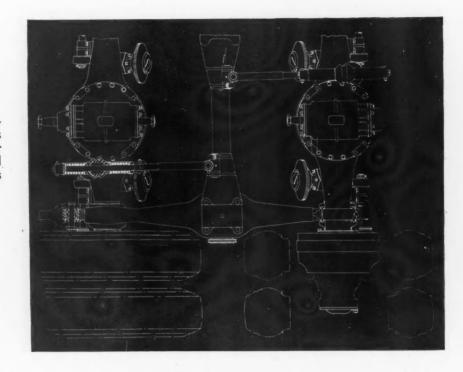
TIMKEN MAKES ASCENT

Two torque rods with double springs at axle ends are used in stead of four rods as used on 300 and 400 high pressure series

HE Timken-Detroit Axle Co. has expanded its line of four-wheel-drive tandem axle units to include four new models carrying dual balloon tires. The new units, which are comparable in carrying capacity to the high-pressure tire SW 300 and 400 series are offered with either worm or double-gear reduction drive. The worm-drive units are designated SW 310 and SW 410 while the double-reduction units are labelled SD 310 and SD 410.

To keep within the 96-in. overall width limit imposed by many states a number of modifications from the original SW high-pressure tire series, described in the May, 1929, issue, page 38, had to be made to accommodate low-pressure tires. To permit use of 10.50 dual balloons the track was decreased, and the wheelbase of the unit increased from 46 in. to 52 in.

The larger tires have a load rating approximately 20 per cent higher than the largest tire it is possible to use on the preceding SW series axles. Some sacrifices, of course, had to be made to permit use of these tires. This

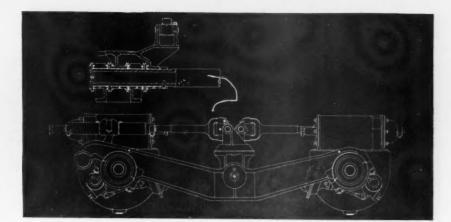


took the form of a reduction in maximum permissible frame width to 34 in. with narrower spacing between spring pads than formerly and greater side clearance between bearings of the equalizer beams and spring pad brackets on the central cross tube. This greater clearance also provides for increase in angle which results when one wheel is raised and the opposite wheel depressed on a rough spot. Leather boots are provided to prevent entry of dirt into the bearings through the larger clearance spaces.

A distinct change in design over former models is substitution of two torque rods with cross-pin connections to central tube for the four ballstud type torque rods formerly used.

While the new units are designed primarily for use of Westinghouse air brakes, provision can be made for hydraulic on the smaller SW 310 axles.

Extending the Timken policy of making heavy-duty axles available in either worm or double reduction gear drive called for some change in design of the front axle in double gear reduction units. Through drive on the forward unit was achieved, as shown by Fig. 1, by reversing position of the bevel ring gear and placing it on the overhanging end of its shaft. This shaft is mounted on three bearings, a large ball bearing near the gear for radial loads and two opposed Timken



Narrower frame width gives greater clearance between central tube and bracket bearings. Boots protect these clearances from dirt. The load beam carries provision for radius rods, if desired

WITH BALLOON TANDEM



One of the new series of Timken front axles. They provide wider tracks and turning angles. Axle centers and steering knuckles are heavier

bearings at the other end for both radial load and thrust.

The gear housing in the front unit is off center 1½ in. to reduce angularity of the unit's propeller shaft caused by taking drive through the bevel gears of the forward unit. Angle of the shaft is less than operating angles of the high pressure tire units.

Housings and shafts for front and rear axles of the double gear-drive units and, of course, the gear carrier cases and their component parts of the front and rear units, are not interchangeable. Otherwise the SD series six-wheel units are identical with their worm-drive prototypes, wheelbase, track, equalizer beams, hubs and

other parts, being interchangeable.

In designing the new units every effort was made to maintain interchangeability as far as possible. Hubs, axle shafts, etc., of the SW 310 series are interchangeable with parts of the Timken 65720 worm-drive axle and parts of the 410 series are interchangeable with those of the Timken 66720 single rear axles.

Timken's new series of front axles provides wider tracks for greater front wheel turning angles with larger tires. A number of these axles are also available in a "modified" wide track, having somewhat shorter spacing between spring pads. These cover the four smaller sizes, and provide

for differences in frame width, with same effective shorter turning radius.

Capacity has also been increased in these axles through the use of heavier axle centers. Steering knuckles are also heavier, and are of the reverse Elliott type with inclined knuckle pins of large diameter. Steering cross tubes are of the ball and socket type, adjustable for length, and provided with automatic take-up for wear. Wheel camber is one degree. A universal mounting has been provided to allow for the installation optionally of Lockheed hydraulic, Bendix Duo-Servo, or Westinghouse air brakes. Cast alloy or stamped steel brake drums are optional on all 16-in. diameter brakes, with cast alloy standard for all 1714 in. brakes.

Effective lengths of steering arms are somewhat greater than formerly, to provide both for the higher maximum wheel angularity (up to 40 degrees) and for the longer pitman arms found on many trucks due to the mounting of the steering gear on top of the frame for powerplant clearance.

A. C. F. BRAKE DRUMS

CHROME-NICKEL alloy cast-iron brake drums, which have been standard equipment on all types of A.C.F. buses for some time before they were made commercially available, have a war-time background. When the American Car & Foundry Motors Co. was making shells, output was limited by the short life of the steel piercing points on the hydraulic forcing presses. The points failed to stand up under the heat and crushing pressure. After considerable experimentation an alloy to withstand these con-

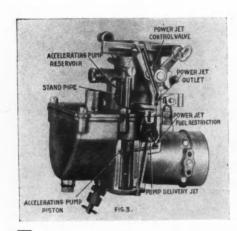
ditions was developed and satisfactorily used. The metal was known as chromenickel and points made of it lasted 20 times as long as formerly.

Later, as load and speed conditions in motor transportation changed, requiring brake drums to accommodate extreme heat and greater pressures and to be made of a material that would not score, mutilate brake lining, flake or warp out of shape, the engineers of the American Car & Foundry Company decided to use the chrome-nickel alloy for this purpose.

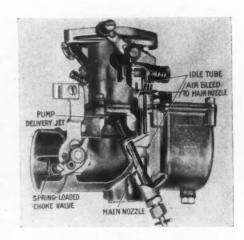


The alloy is of extremely dense structure. The content is uniform, maintaining a Brinell hardness of 260-275 and possessing tensile strength of 45,000-60,000 lb. per sq. in.

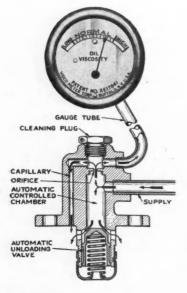
TILLOTSON CARBURETOR



TILLOTSON MFG. CO., Toledo, Ohio, announces the development of a new model "J" carburetor. This new model is being manufactured in a number of sizes to meet the requirements of engines ranging from 30 to 95 hp. Simplicity of design and compactness are among the advantages claimed for the new model. With the exception of the accelerating pump, which is operated directly by a lever on the throttle shaft, there are no auxiliary floating parts. To reduce wear to minimum all wearing parts are sealed against the entrance of dirt, and the throttle shaft is mounted in steel bushings. The body castings are made of zinc die castings, thus assuring uniformity of dimensions and a considerable reduction in the weight. Accompanying cutaway views of the right



and left sides of the carburetor show details of construction and operation.



March, 1931

VISCOSITY METER

HE Visco-Meter, an instrument for measuring and indicating viscosity of oil in engine crankcases, manufactured by the Visco-Meter Corp., Buffalo, N. Y., may be installed on engines with lubricating pressure of at least 8 lb. per sq. in.

Resistance of flow of oil under uniform pressure through a hole of fixed size and a long coil of tubing depends upon the viscosity or body of the oil. This resistance is measured in this device and is indicated on a dial on the dashboard on a scale reading from 30 to 600 seconds on the Sayboldt scale. Design and operation are illustrated graphically. The course of the oil is indicated by arrows.

Pressure in the device is limited to 5 lb. by a spring loaded valve, oil is led through a calibrated orifice and coil of tubing back into crankcase. Pressure in this line is led to the dial on the dash. Owners of trucks can set a standard of viscosity which indicates need of drainage and then change oil according to the instrument rather than on a pre-determined mileage basis.

This device also shows up unproven oils, excessive dilution from badly fitting rings, overheating of engine, oil leaks, faulty oil pumps and dangerously low pressures.

"Declaration of Policy Deemed Necessary to the Continuance of Adequate Transportation Service to the Public," and adopted at a meeting of the railway executives late in 1930.

"Let me read to you," Mr. Chandler went on, "what the railroads believe truck and bus legislation should cover. I quote from their recommendations as published herein:

"'A. Extending jurisdiction of the regulatory authorities over commerce carried by such agencies.

"'B. Certificates of public convenience, after proper showing.

"'C. Proper protective requirements for financial responsibility and surety bonds for insurance.

"'D. Adequate requirements for just and reasonable rates, both maximum and minimum, with provision for publication thereof and adherence thereto, and proper inhibition against undue and unjust discrimination.

"'E. Proper service requirements.
"'F. Adequate authority for rail carriers to operate such facilities, without discrimination in favor of other agencies in the same field.

"'G. Adequate provision for privilege or license fee imposed on all motor vehicles for hire or profit using highways, so as to properly participate in construction and maintenance costs of highways.'

"The final paragraph of the 'Declaration of Policy,' is as follows:

• Grotesque Rhetoric •

OR the policies recommended herein by the Association of Railway Executives they bespeak the earnest and thoughtful consideration of the public, from the standpoint of national interest in maintaining, in the highest degree, adequate and efficient transportation in modern form, with equal opportunity for all.'

"The last paragraph is a very highsounding bit of rhetoric, but in view of
the attitude of the carriers on trucks
and buses, some of the yearning expressed for legislative control is grotesque. I cannot understand these
railroad men at all. These men who,
a few years ago, were classed among
giants of business, now present the
pitiful spectacle of running to cover,
seeking protection against motor vehicle competition. They seem to be in
a panic over the present situation.
The only thought that seems to be

running through their minds is that they can save themselves by legislation intended to hamstring trucks. They seem to be under the impression that, having had a monopoly of the transportation business for so many years, anything which now interferes with that monopoly, or any improved form of transportation which will take away from them the business they have heretofore enjoyed, is an infringement upon their divine rights.

About Face

NSTEAD of looking the situation squarely in the face," declared Chandler with emphasis, "and instead of taking steps to meet the competition, they seem to have collapsed, and their minds appear to be unable to function because of the blow inflicted by the motor truck operators. It makes me tired, and it is not fair to shippers."

"To what do you attribute the popularity of truck transportation?" Mr. Chandler was asked. He replied:

"To service. Service and rapid deliveries. Nothing else. And, too, the railroads themselves are largely responsible for the growth of motor truck operation. It dates back to 10 or 12 years ago when several railroad executives came to the conclusion that short-haul-less-than-carload traffic did not pay, and that the carriers would be better off without it. At that time I insisted the railroads were wrong. and unless they could substantially reduce the force engaged in the handling of freight moving through their freight stations, and thereby eliminate a substantial part of the overhead of handling less-than-carload traffic, they were ignoring one of the fundamentals of manufacturing.

"In other words, I told them then, and I tell them now, that as long as they can increase the number of units handled, without increasing their overhead they are increasing their profits, or decreasing the cost per unit of all their business. This principle appears to have been overlooked by carriers.

"Another thing," went on Mr. Chandler, warming to his subject, "Railway executives and others interested have dwelt at length upon the failure of motor truck companies to protect the interests of the shipper without knowing, apparently, anything about the extent to which motor truck companies do protect the ship-

per, or without seeming to know that the shipper, as a general rule, has sufficient intelligence to protect his own interest. It's all a part of widespread dissemination of such misinformation respecting the taxation and operation of motor trucks engaged in common carrier service. In short, I believe the railroads should:

"1. Stop complaining.

"2. Stop their propaganda.

"3. Stop their misrepresentation."

"Would you care to develop your comments on the seven recommendations made by the Association of Railway Executives, Mr. Chandler?"

"Why not?" he said briskly. "And first of all let me say that in the recommendations of the association covering highway transportation, the carriers have gone rather far afield in that they are posing as voluntary protectors of the shippers without being requested to do so. We don't want gratuitous protection; we want service and rates. The shippers are fully able to protect themselves against failure of highway carriers in the matter of responsibility, insurance and service. I take the following position:

"That until definite need is shown for regulation for the protection of the shipping public, I am opposed to Federal regulation of interstate motor truck common carriers which are now giving a character of service which the rail carriers not only do not offer, but which they have declined to give.

Good With Bad

URTHER than that, I favor an amendment to the Interstate Commerce Act which would give the rail carriers and water carriers subject to the Act the right to make through joint rates with motor truck carrierssubject to all the provisions of the act properly applicable to such traffic; but this is not to be construed as applying to strictly motor truck transportation where no rail-truck coordination exists. In saying this, I am not unmindful that this coordination may result in one railroad tapping the local territory of another carrier, but it is obvious that if coordination is desired by the rail carriers, they must accept all of the disadvantages if they are to enjoy the advantages."

"Are we to assume that you favor railroads going into the trucking business?" Mr. Chandler was asked.

"You can assume," he shot back, "that I believe the railroads ought to be free to run trucks as well as anyone else. If they want to operate trucks through subsidiary companies for coordinated rail-truck service only, they should be allowed to do so most

TURN TO PAGE 50, PLEASE

A SPOKESMAN WHISTLES A WARNING TO RAILROADS

CONTINUED FROM PAGE 22

ROM the White Co. comes the announcement of three new series of six-cylinder truck models, providing a capacity range of from 15,000 to 32,000 lb. gross weight rating and meeting the varied hauling requirements in dump, freight and oil field operation. Eight chassis are included in the three series and are grouped as follows: 620 Series, two models from 15,000 to 18,000 lb.; 630 Series, two models from 20,000 to 24,000 lb., and 640 Series, four models from 20,000 to 32,000 lb.

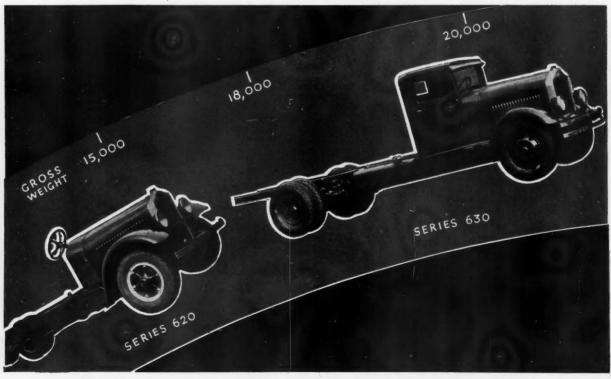
All three series are characterized by unit mounted six-cylinder engines having seven bearing crankshafts; four wheelbase options longest at extra cost; four-wheel brakes; standard and oversize balloon and high pressure tires; cam and lever steering gears; electrical or mechanical fuel pumps; 35 to 50-gal. gasoline tanks; heat-treated reinforced pressed steel frames; full floating type rear axles, and drive through radius rods. Pow-

er take-offs for auxiliary drives also can be furnished and six wheel installations are available in the larger models, increasing gross weight ratings up to 40,000 lb.

The engines are overhead valve type Whites with synchronized two spark ignition, aluminum double strut pistons, seven-bearing crankshafts; pressure lubrication, oil filtering system integral with the oil pan, direct babbitted connecting rods and salt cooled exhaust valves. The same engine, the 4 x 5½ in. Model 3A displacing 396 cu. in. and developing more than 75 hp., is used in the 620 and 630 Series. The heavy-duty series is powered by 4% x 5¾ in. Model 1AB, which displaces 519 cu. in. and develops more than 100 hp.

Single plate clutches with automatic lubrication are furnished in the two smaller series, while two-plate type clutches with special spring loaded engagement and lubrication to ball bearing clutch throughout are employed in the 640 Series. Four-speed transmissions are provided in all three series, but an auxiliary transmission can be fitted behind the main transmission at extra cost in the 630 and 640 Series. The rear axles of the series vary both in capacity and drive. These differences are revealed in the accompanying box.

NEW WHITES HAVE



Specifications of Three New White Series

640	641	642	643
	200,000 to	32,000 lb	
	157-180-19	5-214 In	
9.00/20	9.75/20		
35 gal.	35 gal.	50 gal.	50 gal.
	Auto	pulse	
			on
4.75 to 5.70	5.85 to 10.15	6.82 to 13.15	6.82 to 13.15
			th wheelbase
	internal	Irlveshaft	
42 x 3—9	42 x 3—11	42 x 3-12	42 x 3-12
56 x 31/2-12	56 x 31/2-16	52 x 5-14	52 x 5-14
5-leaf	4-leaf	none	none

Radiator shells on all models are of attractive design, being of polished cast aluminum with removable core, flexibly mounted on the frame. Cooling is thermostatically controlled.

Although the four-wheel brakes of the entire series are of the two-shoe internal type, those in the 620 and 630 Series are applied hydraulically through Turn to page 77, please

Three New Series, Including Eight Six-Cylinder Chassis, Provide Capacity Range of 15,000 to 32,000 Lb. Gross Weight

WIDE RATING SPREAD



The Commercial Car Journal

\$695 BUYS DIAMOND TI-TON

Entire 1931 Line Also Is Improved

> Diamond T Model 216, a new low-price 1-ton truck chassis



LAPEER-TRAILMOBILE CARRIES 3 TO 5 TONS

Available in Automatic and Manual Types

HE Lapeer and Trailmobile companies, Cincinnati, announce the introduction of a light-duty semitrailer, designated as the 3-5 ton Dispatch. This new unit is available in both automatic and manual types; namely, Lapeer Automatic and Trailmobile Manual. The automatic type has over-riding brakes, which control the speed of the trailer; wide surface rollers on the upper fifth wheel; complete cab control, and an improved support leg. The manual type incorporates a Trailmobile type coupler providing angular coupling and is equipped with parking brake lever located on the side near the front.

Frames are of pressed steel with 6-in. rails of 2½-in. flange increasing to 6½-in. depth beneath center of load. A 3-in. drop in frame lowers loading height.

Ahead of the drop the floor is built on the frame and back of the drop only 3-in, sills are necessary. Cross members are also of pressed steel reinforced by gusset plates. The body is supported in front by special cross angle iron and side brackets. The 21/4 x 3-in. forged chrome nickel steel axles are supported by silicon manganese steel semi-elliptic springs having bronze bushings in spring eyes. Brakes are of the internal type, expanding in 16 x 3-in. drums, and brake shafts float in dust-tight, greasepacked ball bearings; Budd wheels are standard and chassis lubrication is Alemite. The average weight of the Dispatch chassis with brakes is 2200 lb.; length, 15 ft.; width, 40 in.; height on 30 x 5-in. tires, 42 in.; spindles, 2% in.; tread, 611/2

1931 line in appearance, Diamond T Motor Car Co. announces introduction of two new-comers to its family, a low priced 1-ton job, designated as Model 216 and offered at \$695, and a 4-tonner, known as Model 750. Although rated at 1-ton, Model 216 actually carries a maximum gross rating of 8000 lb. It is powered by six-cylinder 3% x 4¼-in. Hercules engine, developing torque of 143 ft. lb. at 800 r.p.m. A companion truck to Model T 216 is being featured by the company. It is a de luxe model which carries a special head, tail and parking lamps, a special chromium plated radiator and a special front bumper. Model 750, rated at 24,000 lb.

DESIDES improving its entire

Model 750, rated at 24,000 lb. gross and designed for heavy-duty, high-speed service, is equipped with a 45% x 51/4 in. Hercules engine displacing 529 cu. in., five-speed transmission, and double reduction axle.

Four-wheel hydraulic brakes are employed on all four-wheel models except the new 750, which is equipped with four-wheel Westinghouse air brakes. All models from the 2-ton Model 303 up to the 4-ton six-wheeler Model 801 are furnished with vacuum booster equipment. The three remaining six-wheelers are fitted with Westinghouse air. All eleven models of the line are supplied with options in wheel and tire equipment and in a wide range of wheelbase length.

Standard cabs furnished with the Diamond T 1931 models are of the de luxe coupe type equipped with clear vision "VV" windshield, airplane type instrument panel with indirect lighting, deep spring cushions and side lights inside the cab. Insulation is placed between the cab and frame to absorb vibration and eliminate effect of frame weave on driver's compartment.



Trailmobile's new 3 to 5-ton manual Dispatch trailer

March, 1931

NEW RELAY TOTES 7½ TONS



Model 100-B Has 43/4 x 6-in. Six

New Relay 100-B heavy - duty 51/2 to 7-ton truck model

ODEL 100-B is the name of a new 5 to 71/2-ton chassis just announced by Relay Motors Corp., Lima, Ohio. This new member of the Relay line is equipped with a Buda GF six-cylinder 4% x 6 in. engine mounted in unit with a Brown-Lipe plate clutch and a Brown-Lipe four-speed transmission, a Relay axle, hydraulic fourwheel brakes and an 8-in. plate reinforced pressed steel frame. The fuel system consists of a 45-gal. gasoline tank located under driver's seat, an electric fuel pump, gasoline strainer and Zenith carburetor. Ignition is furnished by Auto-Lite and starting and lighting by Leece-Neville. Included in the cooling system is a unit mounted centrifugal pump, four blade V-belt driven fan and fin and tube type radiator supported by rubber cushions and springs.

The braking system consists of hydraulic four wheel brakes for service and an external type brake on propeller shaft for parking. Springs are semi-elliptic and drive is taken through radius rods of tubular construction. The Relay rear axle provides a standard gear ratio of 7.4 to 1.

The pressed steel frame, $8\frac{1}{8} \times 3\frac{1}{2} \times 5/16$ in., is reinforced with heavy plate reinforcement at point of greatest stress and is supported on four semi-elliptic springs, 42×3 in. in the front and 56×4 in., rear. Steering gear is of the screw and lever type. Ignition switch is on dash and spark and throttle levers are on steering column.

Metal wheels are standard and are equipped with 9.75/24 in. balloon tires with duals at the rear. Regular equipment includes head and tail lights, indirectly illuminated instrument panel, speedometer and chromium-plated bright-wear.

NEW ANTHONY HOIST HAS NO OIL PIPES

Lifting Element Is Built In One Unit

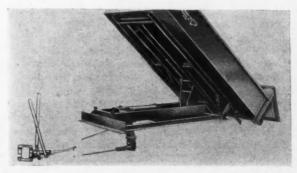
IL conveying pipes have been entirely eliminated in the Anthony pipeless hydraulic hoist, the latest addition to the body and hoist line of the Anthony Co., Inc., Streator, Ill., which is furnished for bodies of one to two cubic yard capacities.

The hoisting element embodies a cylinder, storage tank and conventional gear pump built into a single compact unit which is mounted between the two sills of the body-supporting frame. The cylinder and piston are placed in a horizontal position just behind the front cross-member of the under structure. When lifting, the piston causes a two-legged lifting member with rollers to ride up tracks on the under side of the

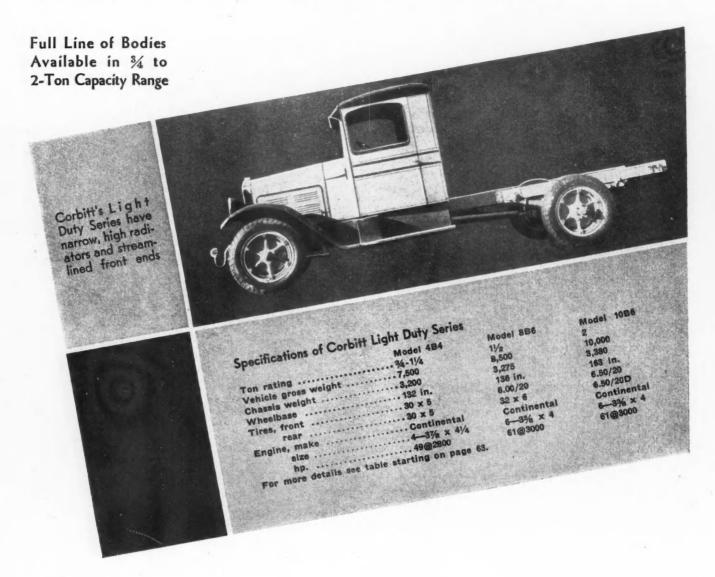
body. Control is from the cab and consists of a power take-off lever and hoist control lever. The storage tank, carrying an extra gallon of oil, prevents formation of air lock. Oil is supplied through a large filler hole at the top of the tank, which also serves as an inspection opening.

Bodies furnished with this hoist are three-point suspended to facilitate dumping on uneven ground, loading height is low, the bottom of the body only being 12 in. above the chassis frame and as the rear end of the body is level with the truck frame when in full dump position, full tail gate clearance is provided. Bodies are made of 10 gage sheet steel.

Anthony's new pipeless hydraulic hoist and 2-yd. body



CORBITT PUTS TONE IN THREE NEW LIGHT SIXES



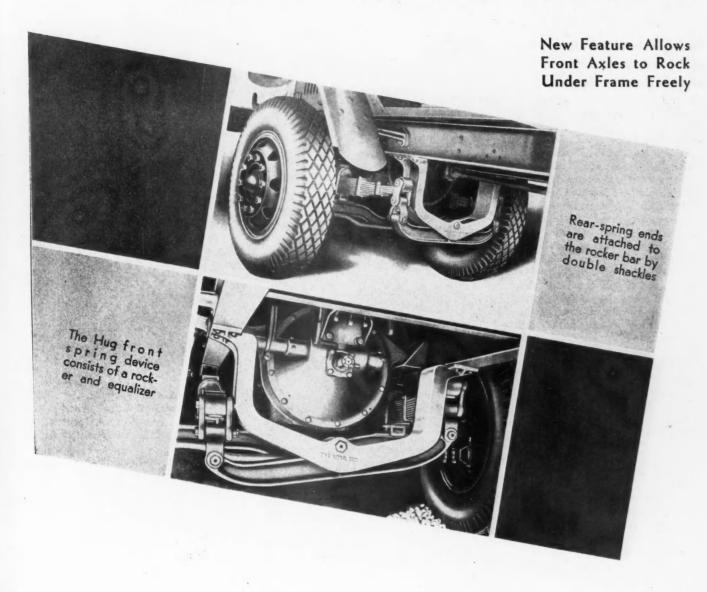
HREE new models, known as the Light Duty Series, are announced by the Corbitt Truck Co., Henderson, N. C. These new units, ranging in capacity from ¾ to 2 tons, are all of the same general pattern, comprising the same major units except engines. Appearance was stressed in design, attractiveness being obtained by the use of high, narrow, chromium-plated radiators, streamlined cowls and hoods with novel louver arrangement and passenger car finish. A full line of cabs and bodies including stake, open express, canopy-top express, panel and school bus are available on the three models.

While L-head Continental engines are employed throughout, Model 4B4, rated at % to 1% tons, is equipped with a 3% x 4%-in. four, developing 49 hp. at 2800 r.p.m., whereas Model 8B6, rated at 1% tons, and Model 10B6, with a payload capacity of 2 tons, are powered by 3% x 4-in. sixes, developing 61 hp. at 3000 r.p.m. Powerplants, including single-plate Brown-Lipe clutches and four-speed transmissions, characterize all three models.

Carburetion, starting, lighting and ignition are similar in the three chassis. The fuel system comprises an 18-gal. gasoline tank located under the driver's seat, Zenith carburetor, air cleaner, gasoline strainer and fuel pump. Delco-Remy equipment is employed for the electrical system.

Final drive is through a full-floating, spiral-bevel rear axle with a 5 2/3 to 1 gear ratio. The pressed-steel frames, 5% x 3 x ¼ in., are supported by four semi-elliptic springs, 38 x 2¼ in., with nine leaves in front, and 50 x 2½ in., with 11 leaves rear. The 2-tonner also has a five-leaf auxiliary spring, 42 x 2½ in. The braking system consists of 4-wheel hydraulics for service and transmission drum for hand braking.

HUG EASES TWIST WITH FRONT SPRING ROCKER



N entirely new principle in frontspring mounting has just been announced
by the Hug Co., Highland, Ill., and put into
production on its Roadbuilder Trucks.
Known as the Hug Front Spring Rocker,
this newly patented device is designed for
application to trucks operating over uneven
roads, and more particularly to trucks used
in excavation and road-building. Use of
the rocker is claimed to allow the front axle
to rock under the frame without twisting or
breaking frame rails, thereby relieving strain
on engine supports or hangers and eliminating twist of cab, radiator or hood.

The Rocker is simple in construction and operation. It is made up of a rocker bar and a special U-type rocker-bar equalizer.

The ends of the rocker bar or cross-member are attached to the rear ends of the two front springs by double spring shackles, which allow full universal movement. The cross-member in turn is pivoted in the center of the U-type equalizer bar, the legs of which are attached to the under side of the frame rails at a point above the rear ends of the springs. The equalizer bar is of channel section, between the legs of which the rocker arm rides.

This new device, an exclusive Hug feature, was developed by C. J. Hug, president of the company, and his staff of engineers. Although production has only recently been announced, a number of Hug Roadbuilder trucks featuring the device were on public display for the first time at the American Road Builders Association Show held in St. Louis, as a Hug development.

Hug engineers say that the extreme stresses and strains to which the conventional type of truck is subjected in road-building work with resultant wear and tear on equipment and loss of time for repairs has been a major problem to operators using trucks in road-building and excavation work.

GRAHAM-PAIGE ADDS 1/2 TON

Priced at \$895 With Panel or Screen Body

RAHAM-PAIGE MOTORS CORP. has announced a new 150-in. wheelbase delivery car of 1000 lb. capacity listing at \$895 with either panel or screen body. In general construction and appearance, the new model follows closely the previous Paige commercial car, retaining all its features of design. The bodies also are identical with those on the former model except that loading space is longer.

The powerplant is a Graham-Paige 3½ x 4½ in. six-cylinder engine displacing 207 cu. in. and developing 66 brake hp. Drive is through a single plate clutch, a three-speed transmission and a semi-floating spiral bevel gear rear axle providing a final reduction of 6.7 to 1. Service brakes are internal hydraulic on all wheels, while the parking brake is on the transmission. Wheels are wood and equipped with 5.50/18 in. balloons.

The side channels of the chassis frame run the full length of the body, eliminating unsupported overhang at the rear. Heavy rear bumpers are mounted at the end of the frame. Shatter-proof plate glass and electric illuminated visor signs are standard. A single key operates ignition lock, door lock and spare lock. Body floor boards are laid with an expanding steel seal between them.



Graham-Paige 1/2-ton equipped with a panel body

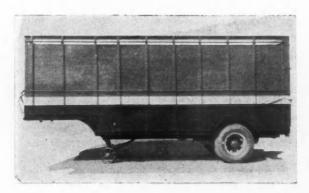
FUHRMAN PRESENTS TWO SEMI-TRAILERS

Offered With Drop Or Straight Frame

HE two-wheel and tandemwheeled semi-trailers recently placed on the market by the Fuhrman Trailer Co., Canton, Ohio, are equipped with booster amplified hydraulic brakes or air brakes and built with either straight or underslung frame of 12 or 18 in. drop. Model S-6, the two-wheel 6-ton job, is furnished in five lengths ranging from 18 to 26 ft. and listing at \$1,815 to \$2,100. Model TT-8, the tandem-wheeled 8-tonner, is available in four lengths, 22 to 28 ft., at \$2,600 to \$2,800. These prices include brakes, tire equipment, front supports and fifth wheel. Oversize tires, drop frames and bodies are available at extra cost. The company also

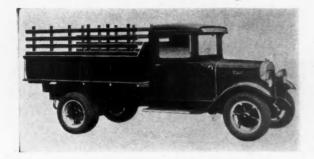
furnishes dollies equipped with 36 x 8 in. dual pneumatic tires at \$1,050 for operators desiring to couple more than one semi-trailer to a tractor.

The fifth wheel is of the 30-in. tilting type and has a large slotted locking plate which turns 90 deg. for coupling. The 7-in. channel frame reinforced with channel cross members closely spaced is supported by two 3½ x 61 in. semielliptic springs. Cast steel, spoke type wheels are carried on 3½ in. tubular alloy steel axles. Braking equipment is optional, being either Westinghouse air or B-K booster amplified hydraulic. Standard or special types of wood or steel bodies are furnished at extra cost.



Fuhrman 6-ton semi-trailer fitted with van body

STEWART BRIGHTENS LINE



Stewart 1/2-ton model showing improved external appearance Body Also Added

New Cab and Panel

POWERMATIC RAMPS BODY FOR LOADING

Slides Loads to Ground Orderly

DEVICE for lowering and raising a platform type body to and from the ground for orderly loading and unloading of commodities is being marketed by the Griswold Powermatic Corp., Detroit. This hoist, known as the Powermatic unit, operates mechanically from power taken through the transmission take-off. It is capable of loading 5 tons and unloading 7 tons.

The hoist element includes reduction gears, running in oil, a long tool steel worm and a threaded cross-head that actuates the body tilting mechanism. I-beams, which serve as tracks and ride on rollers at the rear of the truck frame, take the place of conventional body

sills. The tilting mechanism is attached to a cross-member connecting these beams. Jacks at the rear of the truck frame are provided to relieve the truck axle of strainwhen taking heavy loads.

A lever in the cab engages the power unit for operation. When unloading, the body moves backwards, and as the load reaches the ground, the truck is driven a short distance forward. Action is smooth and the load is laid orderly and without jar or breakage. Loading is accomplished by reversing this action. With the aid of a winch mounted at the forward end of the truck body, loading and unloading of heavy machinery are reduced to a one-man operation.

TEWART, in announcing its 1931 line, states that while no great mechanical change has been made, a number of minor refinements have been added. Appearance of the smaller models, ranging from Model 30 and 30X up to the 21/2-ton model 32X, has been improved by the use of wider cowls and hood, thereby giving these models a streamline effect. Instead of louvers in the hoods of these models, oblong doors are now used. Cowl side lights also are standard in the new line. Besides redesigning the instrument board, a gasoline and temperature gage have been added. A separate switch for the lights is now used and the ignition has a key lock. Except for the addition of cowl side lights, no changes have been made on the remaining units of the Stewart line.

A new cab, which is roomier than those formerly offered, and which harmonizes with the new streamlined cowl and hood of Model 30 and 30X and 32X, has been designed. A semi-deluxe panel body is another new Stewart feature for the 1½-ton model. This body comes in 8 to 9 ft. lengths, is 46 in. wide between wheel housings and 52 in. high inside dimension. List price on the 8 ft. length is \$450.



Griswold hoist lowers platform body to ground

EQUIPMENT FOR SHOP AND TRUCK

Truck Lift

The Globe Machinery & Supply Co., Des Moines, Iowa, is marketing a line of hoists for trucks and buses operating on a pneumatic-hydraulic principle. These lifts, designated as Globe Auto-Hoists, are made in two types, double and single cylinder. Lift is inserted on the axles of vehicles being raised, leaving wheels free. Both types raise to a height of 4½ ft. and incorporate automatic locking devices.

The double-cylinder type is made in two capacities, 24,000 lb. and 18,000 lb. The heavier unit, has two 12-in. cylinders, set at each end of a 26-ft. superstructure. Rails of the frame are slotted at the ends so that the lift can be operated either individually or simultaneously. The lighter model is identical with the heavier unit with the exception that 10-in. cylinders and lighter rails are used. Operation is on the Globe leather cup lifting principle. A leather cup is attached to the piston base. Air entering the oil storage tank, located at the base of the cylinder, drives oil entering the cylinder, forcing the lift of the leather against the cylinder wall and raising the piston. The single-cylinder Globe hoist has a rated capacity of 12,000 lb.

Electric Speedometer

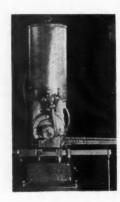
Stewart-Warner is about to bring out a new electric speedometer which has no mechanical connection with the propeller shaft or other chassis operating parts. Its only connection to the other parts is by a cable which may be run between the speedometer



and a converter or interrupter. The new unit entirely eliminates failures due to breakage of the driving cable



on mechanical types. The interrupter may be assembled directly to the sleeve and driven gear, provided the gears are of the proper ratio, without reduction through an adapter. This interrupter may also be adapted to connect to the shaft end of the Stewart-Warner heavy-duty adapter. The speedometer embodies a special type motor operating from the battery current. The rotor of the motor operates in synchronism with the rotor of the interrupter. The odometer will register a million miles.



Tire Gage

A Schrader's Sons, Inc., is offering a new line of pressure gages in which are embodied flat-bar pressure indicators. Graduations on the bars are highly legible and readings are flashed quickly without the need of turning the gage. The new gages also incorporate improved design and are more



sturdy in construction than before. Of the three sizes offered, No. 6060 is designed for testing all types of tires. It is calibrated from 10 to 60 lb. in 1-lb. units and 60 to 160 in 5 lb. units.

Lubricant Tester

An apparatus for testing the load carrying capacity of lubricants is announced by The Timken Roller Bearing Co. The apparatus consists of a cast iron base which supports the testing mandrel, two levers and a container over an electric heater holding about a gallon of the lubricant to be tested. Oil flows from the tank, over the test piece, to a sump in the base by gravity, the rate of flow being adjusted by means of a valve in the line. A mandrel driven at variable speeds receives a cup, which forms one of the test pieces. There are two levers, a load lever and a friction lever, the first above the other. The upper, which carries the test block, is pivoted on a knife edge, mounted in the lower lever. The latter is also pivoted on a knife edge and is provided with a stop at the unloaded end. The test block is a small piece of hardened metal inserted in a notch in the loading lever. The friction lever is provided with a vernier scale, and a sliding weight for obtaining accurate measurements and TURN TO PAGE 76, PLEASE

Cylinder Sleeves

Sleeves for inserting in worn, cracked or scored engine cylinders, thereby bringing the bores back to the standards of a new engine, are being furnished by the Accuralite Co., Muskegon, Mich. These sleeves are of chrome-nickel, which is said to possess seven times the wearing quality of iron, and are free from sand holes and hard spots.

They are especially heattreated to remove casting strains and machined to fit accurately. Sets of all sizes are available.





NO instrument adjustment

There are no brake-assembly problems for the manufacturer who uses Lockheed Hydraulic Brakes.

Just put them on; minimum labor cost, no instrument adjustment—the job is finished!

This extraordinary simplicity and speed of assembly saves time and money.

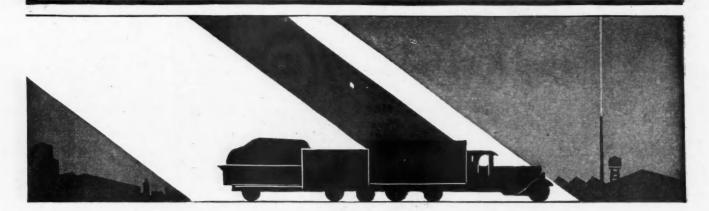
Figuring the cost of your product completed—at your loading platform—you find Lockheed Hydraulic Brakes a very tangible economy.

HYDRAULIC BRAKE COMPANY

DETROIT, MICHIGAN, U. S. A.

(Division of Bendix Aviation Corporation)

LOCKHEED HYDRAULIC Four BRAKES Wheel



TRUCK INDUSTRY NEWS

Ross Gear & Tool Co. report net profit of \$336,461 for year ended Dec. 31, 1930. This compares with \$555,581 for 1929.

At the annual meeting of stockholders of the Autocar Co., the directors were reelected.

S. B. Winn and Henry W. Raymond, formerly of the Lapeer Trailer Corp., are organizing the Winn Trailer Corp. with expectation of getting under production by May.

Wallace T. Miller has been appointed assistant general sales manager of Motor Wheel Corp.

Col. Robert L. Hubler was elected to the directorate of the Ohmer Fare Register Co. at the annual stockholders' meeting.

Frank S. Harkins is the new advertising and sales promotion manager of the U. S. Rubber Co.'s tire department.

Stewart-Warner Corp. reports earnings for 1930 of \$1,262,278, which compares with \$6.838.938 in 1929.

The Four Wheel Drive Auto Co. reports a production increase in 1930 of 12 per cent over 1929.

Paul W. Seiler reports net profit on Yellow Truck & Coach Mfg. Co. for year ended Dec. 31, 1930, of \$1,115,415, which compares with \$1,177,799 in 1929.

Ford dealer discounts have been increased from 17½-21 per cent sliding scale to a flat 22 per cent basis.

M. L. Heminway has resigned as managing director of the Motor & Equipment Association. Future plans are not announced.

F. L. Krause has been appointed manager of the tire service department U. S. Rubber Co.

E. W. Stock has been promoted to the post of general service manager of the White Company.

Gemmer Mfg. Co. reports net profit of \$265,465 for 1930, which compares with \$527,976 in 1929.

J. O. Eaton, chairman of the Board of Wilcox-Rich Corp., has announced the appointment of C. I. Ochs as president of the corporation.

While the Railway Express Agency admits that it is making a survey of store-door delivery, detailed information has not been released.

Geo. N. Walker, advertising manager of the tire department, U. S. Rubber Co., has been appointed advertising manager of the Vacuum Oil Co. with head-quarters in New York City.

A report of a nation-wide survey of truck operation in all types of contracting, entitled "Operating Trucks Profitably in Contracting," is offered by the General Motors Truck Co.

The Budd Wheel Co. reports total net earnings for 1930 of \$1,456,725, which compares with \$1,791,009 for 1929.

F. J. Flynn, sales manager, World Bestos Corp., announced



T. L. Preble, new sales manager of Pierce - Arrow

the introduction of a new type of heavy-duty Grafild brake lining for use on trucks.

R. R. McVicker, formerly Pittsburgh manager of Buick, has been appointed sales manager of the Auto Truck Equipment Co. of Pittsburgh, according to Adam M. Hauber, president and general manager.

R. H. Webb-Peploe has been appointed vice-president of the metropolitan region of White.

J. Howard Pile, well-known in the industry as an editor, association worker and super-service station operator, has been appointed editor of Chek-Chart, a compilation of lubrication charts.

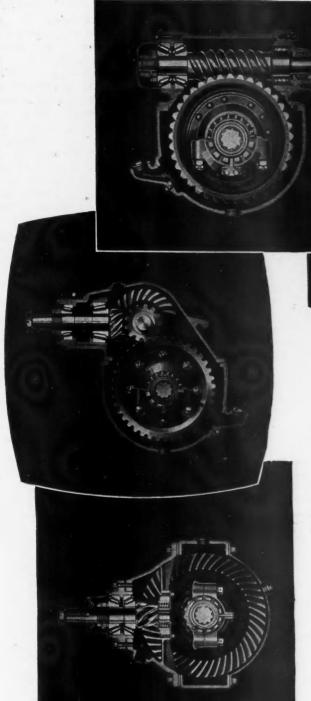
A. G. Bean, president of the White Co., has appointed Nelson S. Gotshall as assistant to the president.

International Harvester's annual report for 1930 reveals a net profit for the year of \$25,703,000, or 7.5 per cent on the capital invested.

A series of numbers ranging from 10 to 70 to denote the viscosity of lubricating oil has recently been developed by the Society of Automotive Engineers in cooperation with leading automotive and oil manufacturers to take the place of the old general classification. These numbers will not refer to the quality of the oil.

David Ainsworth, until recently assistant advertising manager of the Hart-Parr Co., has been appointed advertising manager of the Diamond T Motor Car Co.

The Luce Co., of which Homer D. Luce is president, has acquired the commercial body department of Hughes, Lyons & Co. of Lansing, Mich.





Timken Axles for trucks form a complete line; an axle for any type of commercial motor vehicle; standardized as never before; rear axles with worm and double-reduction driving units interchangeable in every capacity.

Timken Axles for Motor Trucks represent a most important service to economically sound transportation.

THE TIMKEN-DETROIT AXLE COMPANY
DETROIT . . . MICHIGAN

TIMKEN AXLES



A SPOKESMAN WHISTLES A WARNING TO RAILROADS

CONTINUED FROM PAGE 37

certainly. In this, however, I hope they have the intelligence to put a practical truck operator at the head of their trucking service.

"Now, if and when the carriers begin to operate trucks in a coordinated service, care must be taken that the competition they give will be fair to truckmen competing with the coordinated operation. If they merely engage in trucking for the purpose of knocking down existing truck lines, there will, unquestionably, be trouble. They will be likely to get the same sort of restrictions that followed the Panama Canal Act, which made it illegal for rails to have any interest in ships going through the canal.

"I am unable to understand," declared Mr. Chandler, "why the railroads cannot see that they would make more money from motor-truck coordinated rail operation than they do on the rails alone. Perhaps some day they will. Again, they may not. What they should do is to advocate, as I do, an amendment to the Interstate Commerce Act giving the carriers the right to make joint rates with motor truck carriers, the rates to be included in published tariffs. The joint rates so made would be subject to the I.C.C., exactly in the same way as joint rates between rail carriers. But probably that's too much to hope for."

The writer put another and final question to Mr. Chandler. It was:

"Have you heard of the new plan on which the Pennsylvania Railroad is working; a plan for the use of tractors and trailers which they own?"

"Yes," snapped the traffic manager, "and it's the most damn fool thing I've heard about to date. The plan is along the following lines; that is, it was told to me as follows:

Madness

T the option of the consignee, freight will be taken from cars at rail-head in Jersey and loaded onto trailers owned by the Pennsylvania Railroad. For loading the freight onto the trailers a charge of 50 cents a ton will be made to the consignee. Then, Penn-road tractors will hook onto the trailers and haul them to New York, to a point on the waterfront—presumably a pier station. The trailers, I am told, will have a patented hook-up which is so constructed as to permit

any tractor to hook on. Once in New York, the tractor will be detached from the trailers, and the trailers will be parked some place or other, to be later hauled away by the truckman for the consignee. There seems to be some indecision as to whether or not a charge will be made for the rental of the trailers. I have heard a charge will be made, and I've heard it expressed negatively as well. The latest news has it that a charge for trailer rental will only be made to the consignee when the trailer is away from the railroad's tender care for a period of time deemed excessive. Under the plan the truckman must haul the trailer back again to the place he took it from. If that isn't the most weird

maneuver I've heard to date, what is?

"How will it help anybody, save to eliminate public loaders on railroad piers?" demanded Chandler. "And vehicular traffic in the city isn't being cut down-it's being increased, under the plan. Of course, from a railroad viewpoint, it will prohibit the carrier from paying any money to truckmen direct-it will eliminate rebating by draymen. At the same time, with all the available equipment in New York, and with a need for store-door delivery so obvious that even a blind man could see it, the latest version of railroad efficiency seems just a little mad. However, I reserve the right to change my mind if any more helpful details are forthcoming which will change the complexion of the proposed operation.

"Well," concluded Chandler, "I reckon you've surveyed the transportation landscape through the shipper's eyes long enough, haven't you?"

We laughed uncertainly. "Maybe," we returned. "But the view is pretty good! Thanks for the look. G'by."

TRUCKS ARE ADS AND ADS PAY

CONTINUED FROM PAGE 20

ing more than 2500 bottling plants in nearly every state in the Union and in several Canadian provinces.

Now let's get back to this circulation proposition. There is not one among you who is not trying to promote home consumption. You know you cannot buy advertising space on the best residential streets; it just isn't for sale at any price, but . . . you must instill that urge to buy in the minds of the housewives on those streets, and you have the means to do this at your disposal. . . . That means is distinctive and attractive delivery trucks, and trucks, unlike walls or posters, do not have to wait for the chance passerby to be seen. They are not dependent on circulation at any one spot, but circulate constantly through the areas in which advertising space is unobtainable.

You have a similar situation in the business sections of your communities that advertising space isn't for sale. Yet, right in those sections you have the greatest circulation of people . . . and they are apt to be in a spending humor or they wouldn't be downtown. You want their nickels and what are you doing about it?

I have been using the words attractive and distinctive right along in referring to delivery equipment, and these two attributes must be present if the equipment is to have any value either in merchandising or in advertising. As a matter of fact, unattractive and unkempt delivery equipment will act as a retardant to sales.

Can you realize this? I think you can. Suppose, when you get back home, each of you paint a sign on every truck you operate reading something like this: "These drinks are not bottled under sanitary conditions." If you did sales would fall over night.

Yet, in effect, though not so emphatically, many of you are doing just that thing. You are delivering your beverages on dirty, poorly-painted trucks, equipped with nondescript bodies, which are repulsive to the stomachs of many people who see them.

You may have a beautiful plant, most modern in every detail, sanitary to the last degree . . . but who sees it? Not 5 per cent of the people who must drink your product if you are to remain in business. How many of your consumers see your trucks? I will venture to make the statement that there isn't one who doesn't see one of your trucks at least once every day. Your plant breathes the atmosphere of quality and purity, and it right-

STUDEBAKER offers the world's lowest priced 2 ton truck chassis + + + and the most powerful 1½ ton chassis ever sold at \$695 + + + both built by Studebaker to its 79-year-old policy of quality above price.

6 CYLINDERS

11/2 TON

130" CHASSIS . . \$695 160" CHASSIS . . \$775

Dual rearwheels and auxiliary

springs optional at extra cost

2 TON

148" CHASSIS . . \$895 160" CHASSIS . . \$945 136" CHASSIS . . \$945

Dual rear wheels standard. Auxiliary springs optional at

> Prices at the factory **Bumpers** extra

BODIES

Cabs and all standard bodies available with both 11/2 and 2 ton chassis including panel, screen, express, stake, canopy, grain, cattle bodies, dumps.

Half-ton Panel or Screen complete units \$895 at the factory

Correspondence with responsible dealers in open territory is invited. Studebaker or Pierce Arrow truck franchises offer unusual profits.



DEBAKER Trucks

7778808182283838485868688889901010102100310041005100610061006

Elastic Design? "Yes!" Say Operators

CONTINUED FROM PAGE 14

it have been impossible for the manufacturer of this particular engine to have adopted essential dimensions for his four-cylinder engine which would have permitted its replacement with a present-day six-cylinder engine without further change in the chassis? And what of the future, the eight versus the six-cylinder engine?

I am now operating a number of trucks powered with four-cylinder engines and originally equipped with solid tires, which were designed to operate at a maximum speed of 12 to 14 or possibly 16 m.p.h. These trucks are still good for many thousands of miles, and a year or two ago a number of them were converted to pneumatic tires. To do this required a substantial expenditure which resulted only in stepping up the speed capacity to 20 or 22 m.p.h. Long and exhaustive study was necessary to determine that such an expenditure might be justified. It will be recognized that the increase in speed was limited particularly by the engine capacity. On the other hand, considerations of capital requirements finally dictated a program of conversion to pneumatic tires rather than complete replacement.

Hence we are using today a number of trucks which, speaking broadly, are capable, with the exception of the engine, of operating at speeds commensurate with prevailing practice; but, since we cannot modernize the engine and because of the necessity for conservation of capital, we continue to operate a larger number of trucks than would be required with faster equipment.

We as operators would much more readily accept the claims of the manufacturer for long life of those trucks if we could be assured that pure obsolescence would not be likely to dictate a comparatively early retirement of them.

Engineers Say "No!"

of, 100,000 miles say, it would, like the one-horse shay, be ready to drop apart, and still up to that time be sufficiently good to operate economically, that would be fine; but it is not possible, and furthermore economy of manufacture and quantity production makes it necessary that the maker adhere to definite standards of construction, which will give efficient operation so far as possible over the maximum period for which the design is contemplated.

If a manufacturer were to attempt to design one line for short mileage and another for long mileage, expense of manufacture would make the purchase price prohibitive. The best economy for the limited mileage operator is to obtain a type of design which will give economy over the longer period, considering that the parts which wear are readily replaceable and that it is not a case of reconstructing the truck in order to obtain the long mileage life.

B. B. Bachman,

Autocar Co.

I am afraid that if five years ago I had suggested to my company that we should build an automobile into which a six-cylinder engine could be placed within the next several years, they would have consigned me to an insane asylum. I am sure I am not going to take any steps at the present time to say what the future engine development will be. Mr. Bennett has modestly limited himself to an eightcylinder engine. I wish I could be as confident in my own mind that that is going to be the limit.

Other Sessions

HE motor truck and motor coach session was not the only part of the S.A.E. program in which information of value to truck users and sellers was divulged. The airplane engine session gave a hint of future developments in engine design that may make today's ideas as out-of-date as yesterday's newspaper, the fuels meeting presented hot oil as a constant menace to engines, and a bus operator asked for improvements which would appeal to almost all truck fleet owners.

Throwing carburetors away and injecting gasoline either into the intake pipe or directly into the cylinder, after the fashion of a Diesel engine, but firing the mixture with a spark plug, improved both economy and power of a test engine, according to report of a test by C. F. Taylor, E. S. Taylor and G. L. Williams of the Massachusetts Institute of Technology. Although the engine used was of an experimental type and conditions were not those encountered in everyday service, an increase in power of from 7 to 11 per cent in the same cylinder and the fact that the test engine was operated also on fuel oil, with reduced compression ratio, shows the importance of this investigation.

Philip B. Taylor, chief engineer, Wright Aeronautical Corp., spoke about airplane engines, but he said many things not confined to airplane application. "Little reason exists to believe that the limit of engine development in any direction has yet been reached," was one of his observations to which truck men will subscribe. He pointed out advantages from use of higher compression ratios and high anti-knock fuels.

Oil temperatures in excess of 300 deg. have been recorded in engine crankcases, according to W. R. Ramsaur, Harrison Radiator Corp. Oil at 300 deg. is hot. A test car burned out bearings in less than 50 miles when oil reached 275 deg. Keeping oil down to 215 deg. made it possible to run 200 miles at 80 m.p.h. without losing bearings.

Getting rid of heat in engine oil may involve dissipation of 6 hp. of energy. The speaker suggested use of oil coolers to control oil temperatures. An oil cooler makes possible use of a light oil which will flow easily on starting and in cold weather and give lubrication under hard driving.

John B. Walker of the Greyhound Lines, figuratively took a bus apart before his listeners and told them what-but not how-improvements could be made. Grinding up a mountain road "in gear" with a big engine and a heavy load makes no soothing music, in Mr. Walker's opinion. In advocating oil coolers he used the same arguments as those advanced by Mr. Ramsaur. "Braking efficiency on present equipment is satisfactory, but we are of the opinion that longer life could be built into brakes so that. less frequent relining would be necessary." A host of truck and brake designers are getting wrinkles trying to meet this demand. He believes, too, that clutches are constantly in need of repairs and that "a more rugged clutch should be developed to withstand the severe use given this unit under all sorts of conditions."

Truck men may be surprised to hear that "No other unit of transportation equipment lasts so short a time as the motor bus," but Mr. Walker so stated without any ifs, ands or buts.

Trucks Are Ads and Ads Pay

CONTINUED FROM PAGE 50

fully should, for these are the fundamental essentials in a successful bottling enterprise, but why not extend this atmosphere to your delivery equipment? Why not tell all the people in your territory the same story your plant tells a pitiful few? Why not capitalize on the merchandising value inherent in such a plan and benefit in increased sales and profits? That's it, why not? And there isn't an answer, because the way is open to all of you.

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4			Ger	neral		Tir	e Size				ı	Engine								Fu		Sys	trical tem
Make, Model and Capacity	Chassis Price	Standard W.B.	Max. W.B. Furnished	Gross Vehicle Wt. (See Key Note)	Chassis Wt. (Stripped)	Front	Rear	Make and Model	Number of Cylinders Bore and Stroke	Piston Displacement	N.A.C.C. Rated H.P.	Max, Brake H.P. at Specified R.P.M.		Camshaft Drive		Length Main Bearings	No. Main Bearings	Olling System	Governor Make	Carburetor Make	Fuel Feed	Ignition System Make	Generator, Starter Make
1½ Ton—Con Fisher-Standard.Spc X F.W.D. H 4 Ford. AA Ford. AA Ford. A4 Ford. Spc X F.W.D. H 4 Ford. AA Ford. A4 Ford. A6 Garford. 91 (X) Gen. Mot. T-25 Gramm. BX-4 Gramm. BX-4 Gramm. BX-4 Gramm. BX-4 Gramm. BX-4 Gramm. BX-4 Hahn-Selden. 17 Hahn. 317H Indiana 89 International SL-34 International SL-34 International SL-34 International SL-36 International SL-37 International SL-36 International SL-36 International SL-37 International SL-36 Inte	3325 510 535 2900 1900 745 1245 895	128 120 131 157 168 162 130 131 131 131 146 142 142 149 136 160	136 160 157 152 152 157 157 165 168 136 160	3150 9300 7800 7800 7800 9000 10000 10000 9200 7900 7900 9000 9000	5300 2723 2811 4700 2850 3385 3200 3385 3390 3650 3650 3595 3600 3595 3600 3595 3600 3650 3650 3650 3650 3650 3650 365	P 30x5 B6. 00/20 B6. 00/20 B6. 00/20 P 34x5 P 30x5 B 6. 00/20 B 6. 00/20 B 6. 00/20 B 6. 50/20 P 32x6 P 30x5 P 30x5	DP30x5 P34x7 P32x6 P34x7 P32x6 DP34x5 DP30x5 P32x6 DP30x5 P32x6 DP30x5 P32x6 DP32x6		4-4x5 4444444444444444444444444444444444	200. 4. 251. 0. 200. 5. 309. 6. 200. 3. 200. 4. 200. 3. 200. 4. 200. 3. 200. 4. 200. 3. 200. 4. 200. 3. 200. 4. 200. 200. 200. 4. 200. 200. 20	24.06.225.624.00 31.5226.331.5226.331.5226.33227.33227.333.75.75.333.75.333.75.333.75.333.75.333.75.333.75.333.75.333.75.333.75.333.75.333.75.333.75.333.75.333.75.333.75.333.75.333.75.333.75.	49-2800 50-2000 40-2200 40-2200 40-2200 40-2200 53-2200 53-2200 53-2200 53-2200 53-2200 53-2200 53-2200 53-2200 63-2760 64-2000 63-2760 64-2800 61-2750 66-2600 65-2800 70-3000	THUTTITHE COORD CO	ACAACCBCAACA CCCCCCCCCCCCCCCCCCCCCCCCCC	22112222222222222222222222222222222222	5 1/8 8 7	3333344343434777375554447774477444777447744	PC PC PG PC PC PC	N. NANNANHANOOOOOOOOOOOOOOOOOOOOOOOOOOOOOO	Zen Zen Zen Zen Zen Zen Mar Mar	MVGGVVVVVVVVMGGVVVVVMGVVVVVVVVVVVVVVVV	A-L A-L Own	A-LLL RADDA-LLR RADDA-LLD RADDA-LLR RADDA-LLD RADDA-LLD RADDA-LD
Cramm	2035 3650 3200 3500 2840 2230 3240 2030	162 180 160 175 150 Op Op Op 156 146 162 109 168	Op Op 160 188 192 192 Op Op Op 170 188 206 Op 144 185	10200 11500 10000 12000 12000 15000 11000 14000 14000 14000 14000 11000 11000	4800 4800 3955 5300 5660 4800 4800 4800 4800 4800 4800 4800 4	B 6.50/20 P 32x6 P 32x8 P 32x8 B 7.50/20 P 34x7 P 34x7 P 34x7 P 34x7 P 34x7 P 34x7 P 34x6 B 7.50/20 B 7.5	DP82x6 DP32x6 DP32x6 DP32x6 DP32x6 DP32x6 DP32x7 DP34x7 DP32x6 DP30x5 DP32x6	Bud KBU-J Bud DW-6 Bud DW-6 Wau TL Con 16C Con 16C Con 16C Con 17E Wau MS Wau MS Wau MS Bud DS6 Bud HS6 Pontiae Buick Buick Own 257 Con W-20	6-31/2 x 4 ½ 6-33/2 x 5 ½ 6-33/	248.3 331.0 224.0 278.0	3 27.3 3 33.7 25.3	65-2700 65-2100 62-2800 85-3000	1111111	0000000	23/8 21/2 23/8 25/8 3 3	8 A 10 9 11 11 11 11 11 11 11 11 11 11 11 11 1	74447777777337444777777773344347777777443444374 :57743	PC CCPPCCCPPCCCCCCCCCCCCCCCCCCCCCCCCCC	Str On 	Zen	VVGMVVMMMVVVVVVMMMMVEEVVMVVVVVVVVVVMMMMMMMGGVVVVVMMGV	A-BO D-R	A-L D-RR A-L A-L A-L N-E A-L D-RR A-L A-L A-L A-L A-L A-L A-L A-L A-L A-L

Line Number

İ	Clutch	Gear	1	-		No.	Re	ar A	xle			Front Axle	Bra	kes			Frame		Body	Mout	nting	Sp	rings	
Radiator Make	Type and Make	Make and Model	Location	No. of Forward Speeds	Aux. Locat. and Speeds	Universals Make and	Make and Model	Final Drive and Type	Drive and Torque	Reduc. in High	R.duc. in Low	Make and Model	Service	Area Service Brakes	Hand	Steering Gear Make	Dim. Side Rail	Type	Cab to Rear of Frame	Cab to Rear Axle	Width of Frame	Front	Rear	Auxiliary Type
1 Lon 22 Per 4 Oct 20 Per 5 Per 6 Pe	P.Lon D.Det P.Lon D.B-L P.B-L P.B-L P.Own D.Jon D.Jon D.Jon D.B-L	B-L 20 B-L 35 B-L M.M. Own Own Own T B-L 214 B-L 215 B-L 215 B-L 20 Own BG B-L 35 B-L 20 Own Own T B-L 20 War War War War B-L 35 B-L 20 War War B-L 20 War B-L 20 B-L 20 B-L 20 B-L 20 B-L 35 B-L 20 B-L 20 B-L 35	ddadday ddddadadadddaddadadadadadadadada	44444444444464666666666666666666666666	NOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOO	Own 2 Own 2 Own 2 Blo Blo Spi Blo Blo Spi Blo Spi Spi 3 M.M.5 M.M.5 M.M.5	Tim Tim 52200 H Tim 52000 H Tim 54200 H Tim 52200 H Tim 52200 H Tim 52200 H Tim 52200 H Tim 54200 H Tim 5400 T Tim 5400 T Tim 5400 H Tim 5400 T T Tim 5400 T T Tim 5400 T T T T T T T T T T T T T T T T T T T	FFWFFWSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSS	U : НЕНЕНИЯ : ПЕНЕНЕНЕН : RRH : RRHH : : НЕНЕНЕНЕНЕНЕНЕН	666582256683 	38. 0. 442. 2.	Own Own Own Own Tim 14704 H Col 5530 Tim 11710 Tim 11710 Tim Tim Tim 12703-H Tim 11703 H Tim Shu Col Own 100	LAIH O4M O4IM LAIH LAIH BAIM BAIM LAIH LAIH LAIH LAIH LAIH LAIH LAIH LAIH	380 308 380 432 292 292 292 346 346 295 308 279 452 229 289 289 289 289 219 219 221 221 221 221 221 221 221 22	2I FXX FFXX TX TX 2I 2I 2I TTX TX	ROSE ROSE ROSE ROSE ROSE ROSE ROSE ROSE	5-5-4-3-3-4-x-4-5-5-5-5-4-3-3-4-x-4-5-5-5-5-3-3-3-4-x-3-x-3	300: 00 004444 ; 0004404000404044444400000000000	84 Opt 128 117¾ 117¾ 96 108	551% 990 488 488 551 566 685 681 566 685 681 681 685 687 687 688 687 688 687 688 688	32 34 334 334 334 334 334 334 334 334 33	100.2 % 30.2 % 30.2 % 30.2 % 30.2 % 30.2 % 30.2 % 40.2 % 41.2 % 41.2 % 41.2 % 40.2 % 42.2 % 42.2 % 42.2 % 42.2 % 43.2 % 33.2 % 33.2 % 33.2 % 33.2 % 33.2 % 33.2 % 33.2 % 42.2 % 4	Cont' 5412 5524 5241 5241 3642 4832 4832 4832 4832 4512 5012	DESTRUCTOR OF THE PROPERTY OF
6 Per 77 G&CO 6 Per 78 G&CO 6 PE	P. B&B P.	Mun Mun W-G T9 W-G T9 Cov W4C Ful 8 U12 Ful KU-10 B-L 35 Ful K U10 B-L 51 B-L B-L	UAUU AU AUUUUUUUUUU	444444444444444444444444444444444444444	NO N	IMMB	Tim 54000H Tim 54200H Tim 65000BX Tim 54200H Tim 54200H Own 8A Own 8D Own 8A Own 8D Tim 54200H Tim 54200H Tim 54200H Tim 56200H Tim 56200H Tim 56200H Tim 65001 Wis 6617 Tim 65001 Tim 54200H Cla B613 Own Own Own Tim 65001 Tim 54200H Cla B610 Tim 54200H Tim 5420H Tim 54200H Tim 5420H T	BBSFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFF	RRHHHHRRRRH HHHHHHHRRRHHHHRRRHHHH HHHHHHHH	66.680220666.838366.338566.583366.388566.583366.388566.583856.58385666.58385666.58385666.5838666.58385666.5838666000000000000000000000000000000000	22. 8. 8. 45. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1.	Col 4003 Tim 14703H Tim 14703HX Tim 31000H Tim 14703 Tim 31000H Tim 14703 Shu 5429 Shu 5429 Shu 5429 Shu 5429 Shu 5429 Shu 5429 Tim 12703H Tim 15302 Wis Tim 14704 H Col 5530 Tim 14704H Tim 15302 Shu 550 Tim 14703H Tim 14703H Tim 14703H Tim 12703H Cla F308 Cown Cown Tim 14703H Tim 14704H Col 5530	L41H L41H	456 450 450 460 460 353 356 338 394 297 276 350 350 350 450 450 450 450 450 450 450 450 450 4	TX TD 21M 21M TX TX TX TX TX	Ros Ros Ros Ros Ros Ros Ros Ros Ros Ros	6x2 x	PRITTIPPPCTTTCCCCCTTTCCCCCCCCCCPPPPPPCCCCCCCC	501	Opt Opt 69 69 Opt 78 90 S3 85 S5 82 S2 82 S6 94 45 S8 88 S6 94 71 S6 94 7 S6 94 71 S6 94 71 S6 94 7 S6	344 344 344 344 344 344 344 344 344 344	40x2/5 40x2/5 42x2/5 42x2/5 40x2/5 40	74	NAME OF THE PRODUCT OF THE PROPERTY OF THE PRO

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			Gen	eral		Tire	Size				E	ngine								Fue Syst		Elect		
Make, Model and Capacity	Chassis Price	Standard W.B.	Max. W.B. Furnished	Gross Vehicle Wt. (See Key Note)	Chassis Wt. (Stripped)	Front	Roar	Make and Model	Number of Cylinders Bore and Stroke	Piston Displacement	N.A.C.C. Rated H.P.	Max. Brake H.P. at Specified R.P.M.	Valve Arrangement		Dia. Main Bearings	Length Main Bearings	No. Main Bearings	Olling System	Governor Make	Carburetor Make	Fuel Feed	Ignition System Make	Generator, Starter Make	I ton Number
Carter	3577 3990 3500 4590 2250 2250 2250 2675 3940 4000 3240 4000 3240 4580 1695 1895 1895 1895 1895 1895 1895 1895 18	1786 186 186 186 186 190 170 170 170 170 170 170 170 170 170 17	175 210 179 189 199 199 199 199 199 199 199 199 19	15000 11000 17000 14000 16000 15000 15800 15800 17000 15000 17000 17000	5000 4500 4500 4500 4500 4500 4500 4500	P 32x6 B 7.50/20 P 32x6 B 7.50/20 P 32x6 P 32x8 P 32x8 P 32x8 P 32x8 B 7.50/20 P 32x6 P 32x6 P 32x8	DP3-2320 DB7.50/20 DB7.50/20 DB7.50/20 DB7.50/20 DB7.50/20 DP3-4x7 DP3-50/20 DB8.25/20 DB8	Buick Buick Own 257 Lyc ASD Bud H298 Con 16R Con 16R Con 16R Bud W-6 Bud WBU-1 Con Her Con Her Has 151 Ha 8151 Has 151 Has 151 Has 151 Her WXC Con 16R Bud Lyc TF Her YXB Con 16R Bud Lyc TF Her WXC Her WXC Her WXB H	0-3x4 x4 x6	331, 2246, 7 339, 339, 339, 339, 339, 339, 339, 339,	38. 4 38. 4 38. 4 38. 4 38. 4 38. 4 38. 4 38. 4 38. 4 40. 8 38. 4 38. 4 40. 8 38. 4 40. 8 38. 4 40. 8 38. 4 40. 8 38. 4 40. 8 38. 4 40. 8 40. 8	61-3000 61-2750 74-2400 61-2750 74-2400 65-2400 70-2500 70-3000 70-3000 70-3000 70-3000 70-3000 70-3000 65-2600 64-2100 65-260	LLLLLLLLLLLLLLLLLLLLLLLLLLLLLLLLLLLLLL	OCCCCCOAAACCCCCCCSsssCCCCCCCS	2222 3 5664 446 15344166665156666333333332222	983分子 1378	\$P\$P\$《《《·······························	00000000000000000000000000000000000000	Монетор Моне	zen str zen	VMGGMMMVVWMVVVVVMWMMMVM VVVMVVVMWMMVVVVVVVVV	UADAAAADDAAAADDDDAAAAAAAAAAAAAAAAAAAAA	RLURURULURULURAAADDODO-KODODO-KODODO-KODODO-KODODO-KAAA-KAADDA-KAAADDA-KAAADDODA-KAAAADDA-KAAADDODO-KODODO-KAAAADDA-KAAAADDA-KAAADDA-KAAADDA-KAAADDA-KAAADDA-KAAADDA-KAAAADDA-KAAADDA-KAAADDA-KAAAADDA-KAAAADDA-KAAAADDA-KAAAADDA-KAAADDA-KAAAADDA-KAAAADDA-KAAAADDA-KAAAADDA-KAAAADDA-KAAADDA-KAAADDA-KAAAADDA-KAAAADDA-KAAAADDA-KAAAADDA-KAAAADDA-KAAAADDA-KAAAADDA-KAAADDA-KAAADDA-KAAAADDA-KAAAADDA-KAAAADDA-KAAAADDA-KAAAADDA-KAAAADDA-KAAAADDA-KAAAADDA-KAAAADDA-KAAAADDA-KAAAADDA-KAAAADDA-KAAADDA-KAAADDA-KAAAADDA-KAAAADDA-KAAAADDA-KAAAADDA-KAAAADDA-KAAAADDA-KAAADDA-KAAAADDA-KAAAADDA-KAAADDA-KAAADDA-KAAAADDA-KAAAADDA-KAAAADDA-KAAAADDA-KAAAADDA-KAAAADDA-KAAAADDA-KAAAADDA-KAAAADDA-KAAAADDA-KAAADDA-KAAAADDA-KAAAADDA-KAAAADDA-KAAAADDA-KAAAADDA-KAAAADDA-KAAADDA-KAAAADDA-KAAAADDA-KAAAADDA-KAAAADDA-KAAAADDA-KAAAADDA-KAAAADDA-KAAAADDA-KAAAADDA-KAAADDA-KAAADDA-KAAADDA-KAAADDA-KAAADDA-KAAADDA-KAAADDA-KAAADDA-KAAADDA-KAAADDA-KAAADDA-KAAADDA-KAADDA-KAAADDA-KAAADDA-KAADDA-KAADDA-KAADDA-KAADDA-KAADDA-KAADDA-KAADDA-KAAD	NACIDALITATION S. CERREN B. S. C.

Line Number

	Clutch	Gear	Set		o Z	Re	ar A	xle		_	Front Axle	Bra	kes			Frame		Body	Moun Data	ting	Spi	ings	
Radiator Make	Type and Make	Make and Model	Location No. of Forward Speeds	. Locat. and	Universals Make and	Make and Model	Final Drive and Type	Drive and Torque	Reduc. in High	Reduc, in Low	Make and Model	Service	Area Service Brakes	Hand	Steering Gear Make	Dim. Side Rail	Type	Cab to Rear of Frame	Cab to Rear Axle	Width of Frame	Front	Roar	Auxiliary Type
1 Own 1 Own 2 G&c 2 G&c 3 Mod 4 Per 5 Per 6 Pe	P.B&B P.Lon-L. P.B&B P.Lon-L. P.D.B-L. P.Lon-L. P.D.B-L. P.Lon-L. P.D.B-L.	B-L 51 B-L 51 B-L 51 B-L 51 B-L 51 B-L 134 Ful G U14 Ful G U14 Ful G U15 B-L 314 B-L 35 B-L 35 B-L 36 B-L 35 B	DEDDEDDEDDEDDEDDEDDEDDEDDEDDEDDEDDEDDED	45554444444454474	Bio 3 Bio	Wis 6617 Tim 54200H Tim 54200H Tim 54200H Tim 54200H Tim 5400h Tim 5400h Tim 5400h Tim 5400h Tim 5420h Wis 4610 Own 30 Own 20 Own 60 Own 60 Own 67 Own 68 Own 68 Own 69 Own 60 Ow	WFS 25 FF 25 25 FF FF FF WWB FF FF FF WWW BUSS BWW WSSS BWW WB WSS BWW WSSS BWW WB WSS BWW WSSS BWW WSS BWW WSSS BWW WSSS BWW WSSS BWW WSSS BWW WSSS BWW WSSS BWW WSS BWW WS BWW WW BW WW BW WW WS BWW WW BW WW W	RRH TRHHHRR · · · · · · · · · · · · · · · · ·	7666655556677773556666 7775668857777557 4665556675556655665688777755766767676766885567677756887777557 466555666755566 44666755666 7776676688567677756887777557	37 7 5 6 2 9 1 9 1 9 1 9 1 9 1 9 1 9 1 9 1 9 1 9	Own Own Own Own Own Own Own Tim 12703 H Tim 14704 H Col 5530 Tim 12703 H Tim 12703 H Tim 14704 H Col 5530 Tim 14703 H Tim 15733 H Tim 15733 H Tim 1573 H Tim 1585 B	LAHH LAHH LAHH LAHH LAHH LAHH LAHH LAHH	27402038452245224522452245257885224522452245224522452245224524522452452	TOTTX OF THE TOTAL TRANSPORT OF THE TOTAL TRA	Hann Ros	6 x 3 x 1 x 1 x 1 x 1 x 1 x 1 x 1 x 1 x 1	* XXX *	Var Var Var Var Var 126 154 156 100 173 173 100 100 100 100 100 100 100 100 100 10	83 82 4 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8	342/4 333344 34 4440014/6 3344 333334 34 440014/6 3344 3333334 34 440014/6 3344 33333334 34 33333334 333333333333	38x2440x2444	47.54.33 47.54.33 50.72.24 56.73 56.	LEGALES LANG LANGE LANGES DE LEGALES CO. LEGALES LANGES LA LA LANGES LA LA LA LANGES LA LA LA LA LANGES LA

	_		Ge	neral		Tire	Size				E	ngine							Fu Syst		Elect	tem
Make, Model and Capacity	Chassis Price	Standard W.B.	Max. W.B. Furnished	Gross Vehicle Wt. (See Key Note)	Chassis Wt. (Stripped)	Front	Rear	Make and Model	Number of Cylinders Bore and Stroke	Piston Displacement	N.A.C.C. Rated H.P.		Valve Arrangement	Piston Material	Dia. Main Bearings	Length Main Bearings	No. Main Bearings		Carburetor Make	Fuel Feed	Ignition System Make	Generator, Starter Make
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	Clutch	Gear	Set		- S	Re	ar A	xle			Front Axle	Br	akes			Frame		Body	Moun	ting	Spr	ings		
Radiator Make	Type and Make	Make and Model	Location	Locat. and	niversals Make and	Make and Model	Final Drive and Type	Drive and Torque	Reduc. in High		Make and Model	Service	Area Service Brakes	Hand	Steering Gear Make	Dim. Side Rail	Type	Cab to Rear of Frame	Cab to Rear Axle	. Width of Frame	Front	Reer	Auxiliary Type	Line Number
Per 22 Per 34 Gowon 66 Per 56	D.B-LL D.B-U D.B-LL D.B-U D.B-LL D.B-U D.B-LL D.B-U D.B-LL	Own 2R Own 2R Own 35 Cov W4C B-L 35 B-L 55 Cov W4C B-L 55 Cov W4C B-L 55 Cov W4C B-L 55 Cov W4C B-L 55 B-L 55 B-L 55 B-L 55 B-L 55 Cov Cov Own 5 Cov Cov Own 6 Cov	AADUUUUUUUUAUAUUUUUUUUUUUUUUUUUUUUUUUU	44448574444444448835444444847418554555555555555555447544454444444444	Own control of the co	O'TIM 65200H O'WA H O'WA WIS 892A WIS 8937L O'WA O'WA H O'WA WIS 892A WIS 6731T TIM 65706 TIM 65707 TIM 65706 T	2WEWE 2FF 2WWW WWW WWW WWW WWW WWW WWW WWW WW	HHHRHHHRRRRRRRE EFFE TO THE FEFFE FEFFE FOR THE FOR THE FEFFE FOR THE FEFFE FOR THE FEFFE FOR THE FEFFE FOR THE FOR THE FEFFE FOR THE FEFFE FOR THE FEFFE FOR THE FEFFE FOR THE FOR THE FEFFE FOR THE FEFFE FOR THE FEFFE FOR THE FEFFE FOR THE FOR THE FEFFE FOR THE FEFFE FOR THE FEFFE FOR THE FEFFE FOR THE FOR THE FEFFE FOR THE FEFFE FOR THE FEFFE FOR THE FEFFE FOR THE FOR THE FEFFE FOR THE FEFFE FOR THE FEFFE FOR THE FEFFE FOR THE FOR THE FEFFE FOR THE FEFFE FOR THE FEFFE FOR THE FEFFE FOR THE FOR THE FEFFE FOR THE FEFFE FOR THE FEFFE FOR THE FEFFE FOR THE FOR THE FEFFE FOR THE FEFFE FOR THE FEFFE FOR THE FEFFE FOR THE FOR THE FEFFE FOR THE FEFFE FOR THE FEFFE FOR THE FEFFE FOR THE FOR THE FEFFE FOR THE FEFFE FOR THE FEFFE FOR THE FEFFE FOR THE FOR THE FEFFE FOR THE FEFFE FOR THE FEFFE FOR THE FEFFE FOR THE FOR THE FEFFE FOR THE FEFFE FOR THE FEFFE FOR THE FEFFE FOR THE FOR THE FEFFE FOR THE FEFFE FOR THE FEFFE FOR THE FEFFE FOR THE FOR THE FEFFE FOR THE FEFFE FOR THE FEFFE FOR THE FEFFE FOR THE FOR THE FEFFE FOR THE FEFFE FOR THE FEFFE FOR THE FEFFE FOR THE FOR THE FEFFE FOR THE FEFFE FOR THE FEFFE FOR THE FEFFE FOR THE FOR THE FEFFE FOR THE FEFFE FOR THE FEFFE FOR THE FEFFE FOR THE FOR THE FEFFE FOR THE FEFFE FOR THE FOR THE FEFFE FOR THE FOR THE FEFFE FOR THE FEFFE FOR THE FEFFE FOR THE FEFFE FOR THE FOR THE FEFFE FOR THE FEFFE FOR THE FEFFE FOR THE FEFFE FOR THE FO	0 180503895-5478875353-30490001-1114-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-	37.7 4 6 4 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 7 7 7 7	7 Trun 15300 H Tim 15733 H Tim 15733 H Tim 15733 - I Tim 15733 - I Shu 5582B 3 Own 3 Own 3 Own 8 Own 8 Own 8 Own 8 Own 8 Own 5 Own 9 Own 8 Shu 5550 0 Shu 5550	LAIHY LAIHH LAIH	766 2756 6577 6577 6577 6577 6577 6577 6	21 21 21 21 21 21 21 21 21 21 21 21 21 2	RWO WOO REAL JACON OF THE PROPERTY OF THE PROP	6x3 ½ x ½ x ½ x ½ x ½ x ½ x ½ x ½ x ½ x ½	COCOTTOCOCCOCA TO MAN T	1737 1355 1333 1333 1333 1333 1333 1333	106 176 776 37 00 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	33 34444444 33444 334344 33131314 33222 34544 33444 33434 331333 33333 33333 33333 33333 33333 33333 3333	39x2 4 40x3 4 41x2 4 41x2 4 41x2 4 41x2 4 40x2 4 4	54	25.7.14 (4) (25.7.13.13.14.14.15.16.16.16.16.16.16.16.16.16.16.16.16.16.	HILLILILILILILILILILILILILILILILILILILI

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Make, Model and Capacity	Chassis Price	Standard W.B.	Max. W.B. Furnished	Gross Vehicle Wt. (See Key Note)	Chassis Wt. (Stripped)	Front	Rear	Make and Model	Number of Cylinders Bore and Stroke	Piston Displacement	N.A.C.C. Rated H.P.	Max. Brake H.P. at Specified R.P.M.	Valve Arrangement	iston Ma	Dia. Main Bearings	Length Main Bearings	No. Main Bearings	6	Governor Make		Ignition System Make	Generator, Starter Make
Autocar, 3-3/4T, SH8 Autocar, 3-3/4T, TEA Brockway 195 ColemanD-40X 3/4-5t Commerce	t'd 4600 4800 5350 4400 5250 4500 3860	222 114 114 192 170 190 130 175 202 130 165	222 161 161 242 224 Op 184 192 222 218	22000 24000 24000 22000 19500 16975 21100 19400 17000 19000	8400 6550 8900 5975 7500 8200 6500 6500 6500 7200 8200 7200 8400 7200 8400 7200 8400 7200 8400 7200 8400 7200 8400 7200 8400 8400 8400 7200 8400 8400 8400 8400 8500 8500 8500 85	B 9.75/20 P 40x8 P 36x8 P 36x8 P 36x8 P 34x7 S 36x8 P 34x7 S 36x6 F 34x7 S 36x6 F 34x7 F 34x7 F 36x8 F 36x8	DP40x8 DP36x8 DP36x8 DP36x8 DP34x7 P 40x8 36x12 DP34x7 P 40x8 36x12 DP34x7 DP34x7 DP34x7 DP34x7 DP34x7 DP36x8 DP38x9 P 38x9 DP36x8 DP36x8 DP36x8 DP36x8 DP36x8 DP36x8		2.00 6.4 1/4 x4 1/4 6.4 1/4 x	380.00 404.00 404.00 404.00 404.00 404.00 405.00 411.00 41	40. 8 40. 8	87-2400 92-2400 92-2400 92-2400 85-2400 85-2400 85-2400 85-2200 85-2200 81-2400 02-2400 78-2250 82-2400 76-2500 76-2500 76-2500 76-2500 76-2500 82-2400 89-2400 89-2400 89-2400 89-2700 88-2400 89-2700 88-2800	RILLIALLILLEHHHHHHLLLHHHHLLLLHHLLLLHHLLLLLLLLL	CACCNCCCCCCNNNNCCCCCCCNAAACCCCCCABCCCCAACCCCCBBCCNN	THE CONTROL OF THE CO	14 14 14 14 14 14 14 14 14 14 14 14 14 1	7 FPPPCFPPPFFFFCCCFPPCFFFFFCCCFPPCFFFFFCCCFPPCFFFFFCCCFPPCFFFFFF	Hand Hand No. Co. Co. Co. Co. Co. Co. Co. Co. Co. C	Zen Str	VGGGVWWVVVVWWWVVVVWWWWWWWWWWWWWWWWWWWW	A-LO A-A-BOD-R A-LO DO-R DO-R DO-R DO-R DO-R DO-R A-L DO-	A-LNNNLL-NLL-RA-LR-RA-RA-LR-RA-RA-LR-RA-RA-LR-RA-RA-LR-RA-RA-LR-RA-RA-LR-RA-RA-RA-LR-RA-RA-LR-RA-RA-RA-LR-RA-RA-RA-RA-LR-RA-RA-RA-RA-RA-RA-RA-RA-RA-RA-RA-RA-RA
Amer. La France. 12R Armleder	4800 5330 4800 5330 4800 5330 4800 5330 4800 5450 55650 5650 5750 5750 5750 5770	Or O	1 160 1 199	20000 16330 19313 220000 4 22000 6 18788 19556 21556 21556 22506 6 22000 6 22000 6 22000 6 22000 1750 0 1900 0 1900 0 1900 0 1800 0 1795	7506 6500 820 820 820 820 820 820 820 820 820 8	P 36x8 0 P 36x8 0 P 34x7 0 P 36x8 0 P 9.75/20 0 P 40x8 0 B 9.75/20 0 S 36x5 0 S 36x5 0 S 36x5 0 S 36x5 0 P 36x9 0 D 9.36x6 0 P 36x6 0 P 36x6 0 P 36x6 0 P 36x6 0 P 36x8	DP36x8 DP34x7 DP36x8 DP34x7 DP36x8 DB9.75/20 DP40x8 DB9.75/20 DS36x6 DS36x6 S 36x14 DP38x9 DP36x8 DP36x8 DP36x8 DP36x8 DP36x8 DP36x8 DP36x8 DP34x7 DP34x7 DP34x7 DP34x7 DP34x7 DP34x7 DP36x8 DP36x8 DP36x8 DP36x8 DP36x8 DP36x8 DP40x8 DP40x8 DP40x8 DP40x8 DP36x8 DP40x8 DP36x8 DP40x8 DP36x8 DP	Con 20R Wau 6AB Con Wau 6AB Con Bud YTU Bud YTU Bud BA 6 Con 20R Con 18R Con 18R Con 18R Con 18R Con 21R Con 21R Bud BA 6 Wau SRL Bud BA 6 Wau SRL Lyc 18 Con 21R Lyc 18 Con 21R Con 20R Con 2	0-4 \$\\\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \	301 429 429 421	448.5 9 9 4 4 4 4 5 5 5 4 5 5 5 4 5 5 5 4 5 5 5 4 5 5 5 4 5 5 5 5 2 3 3 3 5 5 5 5 5 2 3 3 3 5 5 5 5	100-240 100-240 100-240 100-240 100-240 102-240 102-240 102-240 102-240 102-240 102-240 102-240 102-240 102-240 102-240 102-240 102-240 102-240 102-240 102-240 102-240 102-220 102-220 103-20 104-20 105-20 106-20 107-20 108-20 109-20	1	00000000000000000000000000000000000000	できる。 では、 のの内のななななないのかななななななが、 のの内のなななななないのかななななななななな。 のの内のなななななななななななななななななななななななななななななななななな	13 A 13 A 13 A 11 A 13 A		44400040404000000000000000000000000000	u Zees	nnnn fran fran fran fran fran fran fran	7 D-R 7 A-L 7 D-R 7 A-L 7 D-R M A-L 9 Spl 1 Spl 1 Spl 1 Spl 2 Spl 2 Spl 3 Spl 4 Spl 4 Spl 6 Spl 6 Spl 7 V A-B 8 Spl 7 V A-B 8 Spl 7 V A-B 8 Spl	D-R A-L A-L D-R A-L
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		Clutch	Gear	Set	1	, o	Re	ar A	xle			Front Axle	Bri	ikes			Frame		Body	Mour	nting	Sp	rings		_
Line Number	Radiator Make	Type and Make	Make and Model	Location No. of Forward Speeds	. Locat. and	Universals Make and	Make and Model	Final Drive and Type	Drive and Torque	Reduc. in High	Reduc. in Low sal	Make and Model	Service	Area Service Brakes	Hand	Steering Gear Make	Dim. Side Rail	Type	Cab to Rear of Frame	Cab to Rear Axle	. Width of Frame	Front	Rear	Auxiliary Type	Line Number
23456789011234567890122345667890112344567890112344567890112344456789011234456789011234456789011234567890110000000000000000000000000000000000	Lon	D.B-L D.Ful O. H-S D.B-L D.Own D.Own	B-L 55 Ful H U 16 Own Mun B-L 60 Max Mun B-L 55 Max B-L 55 B-L Own Own B-L 60 B-L 51 B-L 51	OAUAUUAAAAAUAAUUA AUUUUUUUUUUUUUUUUUUUU	54 MA 20 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Spi 500 Spi	Own Tim 65706 HP Tim 6520H Tim 65720H Tim 65720H Own U Tim 65706 H Own U Tim 65706H Wis 12372 Wis Eat 74 Own 1200 Own U Tim 65706 H	2FFFWFFWFFWFFWFFFWWFFFWWFFFWWFFFWWFFFZZFRWFFZZFRZZFR	HHHRRH RRRRRRRR HRHHRHHBH RRHRRRH RRRHHBRRRHH	88.46699678.788.8890.758.8890.758.88890.758.88890.758.88890.758.88890.758.88890.758.88890.758.88890.758.88890.758.88890.758.88890.758.88890.758.88890.758.88890.758.88890.758.88890.758.88890.758.890.758.8890.758.890.758.890.758.890.758.890.758.890.758.890.758.890.758.890.758.890.758.890.758.890.758.890.758.7590.758.890.758.758.890.758.7590.758.890.758.7590.758.890.758.7590.758.890.758.7590.758.890.758.7590.758.890.758.7590.7590.7590.758.7590.7590.7590.7590.7590.7590.7590.7590	53 6 6 10 1 5 6 10 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	Tim 15302 Wis Tim 16302 Tim 16302 Tim 16302 Own Own Tim 15733H Tim 15733H Tim 15733H Own Own U Tim 16302 Eat 433F Eat 433F Eat 433F Tim 15733-H Shu 610 Shu Eat 74F Own Tim 26450 H Tim 15733H	LAIH O2IM O2IM O2IM LO4ID L04IHV T2IH W2/4IM T2IHW W2/4IM T2IMV OP4M L4IHV L4I	520 767 768 336 660 768 336 420 420 420 420 420 420 420 420 420 420	21M 21M 21M CD CD RTD TTD TTD TTD TTD TTD TTD TTD TTD TT	ROS ROS ROS ROS ROS ROS ROS ROS ROS ROS	8x3 ¼ x ¼ 7x2 ½ x ¼ 7x2 ½ x ¼ 8½ x ¼ 8½ x ¼ 8½ x ¼ 12x2 ½ x ¼ 12x2 x ¼ 12x2 x ¼ 12x2 x ¼ 12x2 x ¼ 12x2	040H000; 0H0000H; HHHHHHHHHHOOO; 000000H0; 0HHOO	221 135 ½ 135 ½ 142 144 144 144 167 119 119 1144 107 134 107 134 107 134 107 134 107 134 107 134 132 132 132 132 132 132 132 133 134 144 144 107 134 142 132 132 132 133 134 144 144 107 134 142 132 132 132 132 132 133 134 144 144 144 144 167 134 142 132 132 132 132 132 132 132 13	105 84 94 94 79 79 79 79 79 79 79 79 79 79 79 79 79	34 \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\	40x2 ½ 39 ½ x2 ½ 40x3 40x2 ½ 2 ½ x44 42x2 ½ 48x3 48x3	Cont' 56x3½ 55x3 35x3 35x3 35x3 35x3 35x3 35x3 3	AND SALVANES OF MANAGEMENTS OF STREET, OVERSTEEN P. STREET, S. STREET, OVERSTEEN P.	12 34 55 67 89 101 112 113 114 115 116 117 118 118 119 119 119 119 119 119 119 119
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Make, Model and Capacity	Chassis Price	Standard W.B.	Max. W.B. Furnished	Gross Vehicle Wt. (See Key Note)	Chassis Wt. (Stripped)	Front	Rear	Make and Model	Number of Cylinders Bore and Stroke	Piston Displacement	N.A.C.C. Rated H.P.	Max. Brake H.P. at Specified R.P.M.	Valve Arrangement		Dia. Main Bearings	Length Main Bearings	No. Main Bearings	Oiling System	Governor Make	Carburetor Make	Fuel Feed	Ignition System Make	Generator, Starter Make
5 Ton—Cont Atterbury 100 Autocar 3½ & 5T C Autocar 757 Available. T-50 Brockway 260 Brockway 1200 Clinton 1201M Coleman X-100 5-6 T Coleman X-100 5-7 T Coleman BA-156 Freeman BA-156 Freeman BA-156 Freeman BA-156 Freeman BA-156 Garford 100 (X) Gen Mot. T61 (X) Gen Mot. T61 (X) Gen Mot. T61 (X) Gen Mot. T62 (X) Gen Mot. T63 (X) Gen Mot	5500 5500 5500 5500 5525 5600	2233 1722 Op 1822 2044 1444 1755 1622 200 200 200 200 200 200 200 200 200	2377 242 Opp 184 192 230 Opp 184 192 230 Opp 184 192 230 Opp 231 240 Opp 231 240 Opp 231 240 240 240 241 235 235 235 235 242 240 240 240 241 250 260 27 281 281 290 21 221 221 235 235 235 235 235 235 235 235 235 235	2800 26000 22000 27050 27150 24300 24000 24000 26000 26000 22000 25000 24000 26000 22000 24000 25000 24000 25000 2	9100 9500 9300 9300 9555 9650 11200 9600 9200	B10.50/20 P 42x9 B 9.75, 20 P 40x8 S 36x6 S 36x6 S 36x6 S 36x6 F 42x9 F 38x9 F 38x8 F 36x8 F	DB9.00/20 DB9.00/20 DP36x8 DP36x8 DP36x8 DP36x8 DB9.00/20 S 36x14 S 36x14 DP36x8 DP36x8 DP36x8 DP36x8 DP36x8 DP40x8 S 40x12 DB9.75x20 DB9.00/20 DB9.75x20 DB9.00x24 DB9.75x20 DB9.00x20 DB9.75x20 DB9	Con 21R Own Own Wau 6RB Con Bud BTU Bud BA6 Bud GL Bud BA6 Con 21R Bud BB0 Con 21R Bud BB0 Bud GL Bud BB0 Bud GL Bud BB0 Con 20R Con 20R Con 20R Con 21R Bud BA6 Bud BA6 WauSRL Con 16H Her G Lyc TS Con 21R Bud BA6 WauSRL WauSRL Was BSRL Own AC Own BK Own AC Own BC Own	6-4 % x 4 4 % x 4 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6	428.4.453 4453 6777.4.55 510.55 51	48.60.00088.888.900688989898747474648888844648665.00088888888888888888888888888888888	101-2400 101-2400 101-2400 101-2400 1125-2000 61-1400 61-1400 61-1400 88-2400 109-2200 109-2200 109-2200 109-2200 109-2200 109-2200 102-2400 101-2500 102-2400 102-2400 103-2800 104-2500 104-2500 105-200 107-2400 108-200 108-200 109-2500	HUULLELULLEH UULLEH III III III III III III III III III I	0000N00000N0N0N0N0N0N0N0N0N0N0NNNNNNNN	Subsection of the state of the	· · · · · · · · · · · · · · · · · · ·	77747834447784477444744474473477473377473343777774774	######################################	Haa	Zenrestr Zen	VVVVMVVVVVVEEVMMVVEEVMMMMMMVMVVVVMGVVMVPVVVVVVVVVMMMMEVPVVVPPPVVF	A-D-D-R-R-L-R-R-R-R-R-R-R-R-R-R-R-R-R-R-R	LN L-RL-BORR LRRNNL RRRBBEL RRRRRLLLLLLRLR : RLRRREE : B. LLNRNLLLLR LR CAA-AADDOLL ADDOLLA-AAADDOLLA-AAAAAAAAAAAAAAAAAAAAAA
World DB-112 5 1/2 Ton and DB-122 Amer LaFrance. 26 ½ Amer LaFrance. 27 ½ Am -LaF Big Ch. 166 Autocar. F 7½ Ton Clinton. 1208M-7 Ton Clinton. 1208M-7 Ton Coloman F-200 7½ Ton Commerce. 100 25 Corbitt 5-7 T. 33W Federal. X8 R 7½ Ton F. W. D. M7 7½ Ton Freeman. GL. 18 Freeman. GL. 18 Freeman. GL. 18 Freeman. GL. 18 Freeman. BAS-156 5-1 Freeman. BAS-156 5-1 Freeman. BAS-156 5-1 Freeman. Mot. 1025 (X) Gen. Mot. Toloman GL. 18 (X) Gen. Mot. Toloman Gramm. M	5756 6800 15810	10 Op	Op O	30000 30000 32000 32000 27000 28000 28000 28000 22000 22000 22000 20000	9250 9250 1280 900 1050 960 870 870 9765 1038 1038 1038 1038 1038 1038 1038 1038	S 36x7 S 36x7 F 36x6 S 36x7 S 36x7 S 36x6 S 36x7 S 3	DP38x9 DS40x6 DB10.50/2t DS40x8 DS40x8 DS40x8 DS40x8 DS40x8 S36x12 DS 40x14 S 40x14	Own 5R Own 5R Own 5R Own 5R Own 5R Own 6W Own Con Bud BTU Sterling Bud BA6 Con 21R Con B7 Con 21R Wau RB Bud GL 6 Bud BA6 Sud BA6 Bud BA6 Sud GAB Own AC Own BK Own BK Own AC Own BK Own AP Her YXC Own GAB Wau 6KS	\$\\ \begin{align*} 5 - 3 - 3 - 4 - 4 - 4 - 4 - 4 - 4 - 4 - 4	425 - 2 425 - 2 425 - 2 425 - 2 425 - 2 453 - 4 611 - 4 677 - 5 677 -	36, 36, 48, 48, 48, 445, 48, 445, 445, 445, 44	50-120(61-140(177-220(117-220(114-220(114-220(114-220(114-220(114-220(114-220(114-220(114-220(115-220(115-220(115-220(115-220(116-180(116-180(TLLLLLLLLLLLLLLLLLLLLLLLLLLLLLLLLLLLLL	OODITOTOTOTOTOTOTOTOTOTOTOTOTOTOTOTOTOTO	THE PROPERTY OF THE PROPERTY O	9 de	77374737444444444444447437743434777774447	PCFPCCFPCCCCC	On On On On Bu Ha Bu Bu Bu Bu Bu Bu Ha Ha Ha Ha Ha Ha Ha Wa Wa Wa Wa Wa Wa Wa On	Str Str Str Zen Zen Zen Zen Zen Zen Zen Zen Zen Zen	PEEEEVMMMMMMW :EVGVGVMMGGGVVVV :VVVV	N-EL D-R B-B-B-B-B-B-B-B-B-B-B-B-B-B-B-B-B-B-B	ABO D-N L-N R-L D-R R-B R-B R-B R-B R-B R-B R-B R-B R-B R

	Clutch	Gear	Set		No.	Re	ar A	xle			Front Axle	Bra	kes			Frame		Body	Mour Data	nting	Spi	rings	
Radiator Make	Type and Make	Make and Model	Location No. of Forward Speeds	. Locat. and	Universals Make and P	Make and Model	Final Drive and Type	Drive and Torque	Reduc. in High	Reduc. in Low	Make and Model	Service	Area Service Brakes	Hand	Steering Gear Make	Dim. Side Rail	Type	Cab to Rear of Frame	Cab to Rear Axle	Width of Frame	Front	Rear	Auxiliary Type
Per 2 Own 1 You 1 You 2 Per 3 Own 1 You 1 You 2 Per 3 Own 1 You 2 Per 4 Own 2 Per 4 Own 2 Per 5 Own 2 Per 5 Own 2 Per 6 Own 2 Per 7 Own 2 Per 9 Own 2	D.B-L B-L Own P.Own P.Own P.Own P.Own P.Own P.B-L D.B-L P.Lon P.B-L D.Ful D.Ful D.Ful D.Ful D.Ful D.Ful D.Ful D.Ful D.Ful D.Ful D.Ful D.B-L D.B-L P.Own P.B-L D.B-L P.Own D.B-L D.B-	B-L 70 B-L 60 Max B-L 60 Max Ful R U16 B-L 60 Max Mun Mun Mun B-L 60 Max Mun B-L 60 Max	AU AAUU AAAUU . AAAUUUU AUUUU AAAAAAUUU AAAAAAAA	OD ANNO NO SAA 2 2 ANNO SAA 2 ANNO SAA 2 ANNO SAA 2 ANNO SAA 2 ANNO SAA 2 ANNO SAA 2 ANNO SAA 3 ANNO SAA 3 ANNO SAA 3 ANNO SAA 3 ANNO SAA 3 ANNO SAA 3 ANNO SAA 3 ANNO SAA 3 ANNO SAAA 3 ANNO SAAA 3 ANNO SAAA 3 ANNO SAA 3 ANNO SAAA 3 CAAA 3 CAAA 3 CAAA 3 CAAA 3 CAAA 3 CAAA 3 CAAAA	Pet 4 Blo 5 Cle Blo Spi Blo Spi3 Own Spi Spi 3 Spi Spi 4 Spi 4	Tim T' 68702DHP T' 68702DHP Wis 122 Wis 122 Tim 68700DP Tim66704DH	2F WWF 2F WWF 2F WWF WWF 2F WWF WWF 2F 2F WWF 2F 2F 2F WWF 2F 2F 2F WWF 2F 2F WWF 2F 2F 2F WWF 2F 2F 2F 2F WWF 2F	REARING HERRERER HR REARING HER HERRERER REARING REARING TO THE REARING REARIN	7.10 98.75 88.80 98.75 88.80 99.12 10.3 77.6 88.50 10.0 10.2 10.3 10.3 10.3 10.3 10.3 10.3 10.3 10.3	101 63.71 83.66 175.00 50.88 140.61 155.00 50.88 165.00 152.5.5 165.00 152.5.5 165.00 152.5.5 165.00 152.5.5 165.00 152.5.5 165.00 152.5.5 165.00 165	Own Timl6700TW Own Own Own Own Wis Eat 527F Tim 16302 Eat 527E Eat 527E Eat 527E Eat 527E Tim 36900 Tim 30 Wis 30 Wis 30 Wis 30 Wis 30 Wis 30 Tim 16710H Tim 16710H Shu 678 Shu Eat 74C Own 500 Tim 16302 Tim 16302 Tim 16302 Tim 16302 Tim 16302 Tim 16302 Tim 16305 Tim 16302	L4IH O21M L04ID B41A L74IVH T21H T21H T21H W2/4IM W2/4IM W2/4IM T21HV W2/MY L4IHV W2/MY W3/M W3/M W3/M W3/M B4IM B4IM B4IM B4IM B4IM B4IM B4IM B4I	602 664 288 288 652 652 668 552 67 685 574 685 679 482 492 492 492 492 492 492 492 492 492 49	RI RITTO TO TAX	ROS	9x3x 14 8x2x 14 8x3x 14 10x3 14 x 14 10x3 14 x 14 11x2 15 x 14 11x2 15 x 14 10x3 14 x 16 10x2 16	THE CO. TOTTOON : OF THE PROPERTY OF THE COUNTRY OF THE CO. : OFFER CO. : OFFE	221 158 % 175 % 162 175 % 162 175 % 162 165 % 168 168 168 168 168 168 168 168 168 168	70 94 14 69 14 69 14 70 82 141 14 83 14 83 14 81 14 81 17 82 81 14 81 17 81 14	36 34 34 34 34 34 34 34 34 34 34 34 34 34	Ton- 40x3 42½x3 42½x3 42½x3 42½x3 40x3 40x3 43½x3 448x3 448x3 448x3 45x3 45x3 45x3 45x3 45x3 45x3 45x3 45	Con' 56x4 54x4 554x4 54x4 54x4 55x3 54x4 60x3 55x4 60x3 54x4 56x3 54x3 54x3 54x3 54x3 54x3 54x3 54x3 54	1/2 1/2 1/2 1/2 1/2 1/2 1/2 1/2 1/2 1/2
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Make, Model and Capacity	Chassis Price	Standard W.B.	Max. W.B. Furnished	Gross Vehicle Wt. (See Key Note)	Chassis Wt. (Stripped)	Front	Rear	Make and Model	Number of Cylinders Bore and Stroke	Piston Displacement	N.A.C.C. Rated H.P.	Max. Brake H.P. at Specified R.P.M.		Camshaft Drive Piston Material	Dia. Main Bearings	Length Main Bearings	No. Main Bearings	Oiling System	Governor Make	Carburetor Make	Fuel Feed	Ignition System Make	Generator, Starter Make	Line Number
Six-Wheelers Autocar CG 5T Autocar CG 10T Brockway 1-50D B	8250 9000 6000 7500 9000 4140 7500 6220 7900 6900 6500 7500 6400 5285	190 177 213 174 166 166 168 188 188 177 216 23 23 24 144 148 188 118 118 118 118 118 118 11	1 238 1 238 1 238 2 224 4 202 2 224 4 204 4 204 4 204 4 204 4 204 6 20 1 6 1 6 1 6 1 6 1 6 1 6 1 6 1 6 1 6 1 6	30000 36000 40000 35740 28500 40200 21000 21000 28000 36000 36000 26500 36200 36200 11000 11000 28000 28000 28000 28000 28000	13000 12740 12000 12740 12000 12500 12500 15000 15000 12500 15000 15000 12500 15000	P 36x8 P 36x8 P 38x7	DP36x8 DP36x8 S 36x10 DB9.75/207 DB9.75/200 DB9.75/200 DB9.75/20 DB9.75/20 DB9.75/20 DB9.75/20 DB9.75/20 DB9.75/20 DB9.75/20 DB9.75/20 DB9.75/20 DP34x7 DP36x8 DP40x8 DP36x8 DP40x8 DP40x8 DP36x8 DP36x8 DP36x8 DP36x8 DP36x8 DP40x8	Own	6-41/4 x 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4	453.0.0 453.0.0 453.0.0 6111.4 462.4 427.5 6427.5 6427.5 642.0.5 549.0	48.66448.66448.66448.66448.66448.66448.6664.8866648.66448.6664.8866648.664688.66468.66468.66468.66468.66468.66468.66468.66468.66468.66468.664688.664688.664688.664688.664688.664688.664688.664688.664688.664688.664688.664688.664688.664688.664688.664688.6646888.664688.664688.664688.664688.6646888.6646888.664688.664688.664688.6646888	101-2400 101-2400 101-2400 110-2400 110-2400 110-2800 110-2800 127-2300 100-2800 128-2300 100-2000 100-2000 100-2000 100-2000 100-2000 100-2000 100-2000 102-2400 102-200 115-200 115-200 115-200 115-200 115-200 116-200 126-1850 127-200 127-200 127-200 127-200 127-200 127-200 128-200	LLLLHHULLLLLLLLLLLHLH H HLLLLLHHHHHLLLLLLLL	COCAÑÃACOCOCOAAÃÃAAACOCOÑOA A ACOCOCOCOACCOACOCOACOCO :GOS GOCOCO :GOS GOCOCO :GOS GOCOCOCOACOCOCOACOCOCOCO :GOS GOCOCOCOCOCOACOCOCOCOCOCOCOCOCOCOCOCOCOC	SOMEON CONTRACTOR OF THE PROPERTY OF THE PROPE	4. 143 133 133 14	77777777444377777444444444444444444444	44400000000000000000000000000000000000	Haa Haa Bu Waa Waa Waa Waa Waa Waa Waa Waa Waa Wa	Str Str Str Zen Zen Zen Zen Zen Zen Zen Zen Zen Zen	VVEMVVMMMMVVM M MMVVVVVVMMMMVVVVVMMMMVVVM	D-R A-L L D-R A-L L D-R R-Bo R-Bo R-Bo R-Bo R-Bo R-Bo R-Bo R-	L'NN LA-L L'NN A-L L'NN A-L NN	
5 to 7½T White 59A SW400		19	8 210	12400 40000	12200	B9.00/20 P 40x8	DB9.00/20 P 40x8	Own 1AB	6-4%x5%		45.9	1	H		3	15 33 15 33	7 7			Zen	E	L-N	L-N	
White 59A SW400 71/2 to 10 Ton Whiteomb5T Whiteomb10T	6000 7200	01	Op	18000 27500	6000	P 36x8 P 38x9	P 36x8 P 38x9	Wis Z Wis Z	6-41/2x5 6-41/2x5	477.0	48.6	103-2200 103-2200	HH	CC	3 2¾ 2¾	1032	4	FP FP		Str	M	L-N L-N	L-N L-N	

Engine Differences Begin in the Head

CONTINUED FROM PAGE 17

design. The valve at the side, like that in an L-head engine, is the exhaust while the one in the head, like a valve-in-head engine, is the intake.

"The advantages are: it is easy to use large valves in this design without them getting in each other's way. You can't put two 2-in. valves in the top of a 3-in. cylinder without spreading out the combustion chamber. The F-head also brings the gas in at one place and lets it out another."

"How about those valves that work like the cuffs that you were talking about earlier in the evening?" Mac questioned. So we sketched that out for him, too (Fig. 5). "These sleeves," we proceeded to explain, "are pushed up and down by connecting rods from a shaft which takes the place of a camshaft. The big advantage of the

design, aside from quietness, is that it is easy to provide a very large hole for the gas to go into the cylinder and another big hole on the other side of the cylinder for the gas to get out. You don't have to grind them every once in a while, either. Sleeve valve engines have been used in trucks and they are used in many of the big gas-electric drive buses."

"That's all very interesting, Den,"
Mac digs in once more, "but which of
all these arrangements do you think
is the best? Darned if I can make
it out."

"Well, neither can I, Mac," we conclude, "so we're both in the same boat. You probably wouldn't want a revolving front door in your home, but they are fine for hotels. On the other hand, there are the swinging doors—"

"With room to look over the top, and for the dog to run underneath," Mac adds.

"That's your viewpoint," we com-

ment, "but how about Mrs. Mac?"

But the old codger was lost in his reverie, and with a sigh of relief we picked up our latest murder mystery, with some hope of finding out whether the butler, the step-son, or the old enemy from Africa should have the crime tacked on to him. Darned if I could make up my mind which would be the best way for the story to end.

Timken Lubricant Tester

CONTINUED FROM PAGE 46

both levers are equipped with hangers for carrying adjustable weights.

The operation of the device is substantially as follows: With both test pieces in place, the mandrel is brought up to the desired speed and the lubricant, heated to the required temperature, is allowed to flow over the test block. The loading lever is then loaded by means of weights until the desired unit pressure is obtained between the

Line Number Radiator Make	Clutch	Gear Set				.0	Rear Axie					Front Axle	Brakes			Frame		Body	Mout	nting	Sp	Springs			
	Type and Make	Make and Model	ation	f Forward	Aux. Locat. and Speeds	Universals Make and No	ake and Model	Wheels Driven	Final Drive and Type	Drive and Torque		Reduc. in Low	Make and Model	Service	Area Service Brakes	Hand	Steering Gear Make	Dim. Side Rail	Type	Cab to Rear of Frame	Cab to Rear Axle	Width of Frame	Front	Roar	Auxiliary Type
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test pieces. A chart gives the necessary weights on the loading lever per 1000 lb. of unit pressure. The degree of scuffing on the test block which is removed after 30 minutes determines the relative load carrying capacity of the lubricant. In case bearing metals are to be tested both the test block or the cup or both can be made of the appropriate material. In case coefficient of friction of the lubricant is desired, weights are added to the friction lever until it moves away from the stop. Loading the upper lever causes the friction on the test block to move it forward horizontally, unbalancing the friction lever until it rests on the stop. This condition is compensated by adding weights on the friction lever, until the system is again in balance and the lever is off the stop. The coefficient of friction of the lubricant is then calculated from the amount of weight it takes to balance the

Trucks Help Jobbers Squeeze More Sales

CONTINUED FROM PAGE 28

and also spaces for office invoices that are passed over to the salesman for collection. There is, of course, a column for remittances, and at the bottom of the report notations for the salesman to fill in showing his daily routings. Along with the daily report the salesman sends carbon copies of all invoices covering truck sales.

As a closing word, it might be pointed out that traveling stores for the selling of small goods are worth the consideration of wholesalers at this time when a great deal of dealer buying is of the hand-to-mouth variety. With the goods suitably displayed on a truck, it is easier in most cases to close a sale and pass the goods over to the dealer outlet than if the salesman be compelled to rely solely on

pictures in a catalog and word of mouth to convince his customer.

New Whites Have Wide Range Speed

CONTINUED PROM PAGE 39

vacuum boosters, while air is employed in the 640 Series. Hand brakes in all three series are of the driveshaft-mounted, double-drum internal type.

Gasoline tanks are mounted in cradles on the right side with three-point suspension and have capacities of from 35 to 50 gal. All springs are semi-elliptic and in some models are furnished with helpers.

Standard equipment includes: front bumper, speedometers, oil-pressure gage. Controls for light and throttle are fitted in the center of the steering wheel. Cabs can be furnished on all chassis at additional cost.

KEY OF REFERENCES

GENERAL

Gross Vehicle Weight—Chassis weight, plus body and cab, plus pay load.
Chassis Price is for truck with standard wheelbase listed and with three listed F.O.B. factory, unless otherwise specified.

wise specified.

-Price of Mack AC 7-10 ton, \$4,950, tires, S 36x5, DS 40x5; 11-14 ton, \$5,500, tires, S 36x6, DS 40x6; 15 ton, \$6,000, tires S 36x7, DS 40x7.

B-Balloon. B—Balloon.

DB—Dual Balloons standard equipment.

P—High Pressure Pneumatics standard equipment.

DP—Dual High Pressure Pneumatics standard equipment.

DS-Dual Solids

-Pneumatics furnished at extra cost.

ENGINE Make

Bud-Buda Company. Con-Continental Motors Corp. Has—American Car & Fdy. Co. Her—Hercules Motor Corp. Lyc-Lycoming Motor Corp. Wau—Waukesha Motor Co. Wis—Wisconsin Motor Mfg. Co.

Valve Arrangement

H—In head. L—"L" Head. S-Sleeve.

Camshaft Drive

C-Chain

Piston Material

Aluminum alloy B-Semi-steel. C-Cast iron. N-Nickel iron -Aluminum alloy with strut.

Main Bearings

r-Rear main bearing.

Oiling System

CC-Pressure to main, connecting rod and camshaft bearings. FP—Pressure to main, connecting rod, camshaft bearings and piston pins. PC-Pressure to mains and connecting rod bearings.

PG-Pump, gravity and splash PS—Pressure with splash. SP—Circulating with splash

Governor

Bf-Bethlehem Fabricators, Inc. Bu-Buda Co-Continental. Ha—Handy Governor Co. HS—Amer. Car & Fdy. Co. KP—Handy Governor Co.
Mo—Monarch.
No—Not supplied. On-Own -Pierce Governor Co. Si-Simplex (Elsemann Magneto Corp.) St-Sterling. Wa-Waukesha

Radiator

-Bush Mfg. Co. Chi-Chicago Mfg. Co. Fed-Fedders Mfg. Co. G&O—G & O Mfg. Co. Har—Harrison Rad. Corp. Hex-Hexcel Rad. Co. -Long Mfg. Company. McC-McCord Rad. & Mfg. Co. Mod-Modine Mfg. Co. Per—Perfex Corp.
R-T—Rome-Turney Rad. Co. You-Young Rad. Company.

FUEL SYSTEM Carburetor Make

Car-Carter Carburetor Co. Joh-Johnson

Mar—Marvel Carburetor Co. Sch—Wheeler Schebler Co. Ste-Detroit Lubricator. Str—Stromberg Motor Dev. Co.
Til—Tillotson Mfg. Co. Zen-Zenith-Detroit Corp.

Fuel Feed

E-Electric Pump. G—Gravity.

M—Mechanica! Pump. P-Pressure. V-Vacuum.

ELECTRICAL SYSTEMS

A-Bo—Amer. Bosch Magneto Co. R-Bo—Robert Bosch Magneto Co. Apo—Apollo Magneto Corp.

D-R—Delco Remy Company. Eis-Eisemann Magneto Corp. L-N—Leece-Neville Co.
N-E—North East Elec. Co. Spl-Splitdorf Electrical Co. 1—Generator and Starter at extra cost.

2—Starter not supplied. Generator at extra cost. 3-Starter at extra cost.

CLUTCH Type

D-Multiple disk. dp-Double Plate. O-Plate in oil. P—Single plate.

Make
B&B—Borg & Beck Co.
B-L—Brown-Lipe Gear Co. Cla-Clark Equipment Co.
Cov-Covert Gear Co.
D-G-Detroit Gear & Mach. Co. Ful-Fuller & Sons Mfg. Co. H-S-Merchant & Evans Co.
Jon-Jones Clutch & Gear Co. Lon-Long Mfg. Company. M-E-Merchant & Evans.
M.M.-Mechanics Mach. Co. Mun—Muncie Products Div. General Motors Corp. Roc—Rockford Drill Machine Co W-G-Warner Gear Co.

GEARSET Make and Model

-Brown-Lipe Gear Co. Cla-Clark Equipment Co.

Cov—Covert Gear Co.
D-G—Detroit Gear & Mach. Co.
Ful—Fuller & Sons Mfg. Co. M.M.-Mechanics Mach. Co. Mun—Muncle Products-Div.
Motors Corp.
W-G—Warner Gear Co.
War—Warner Corp.

Location

A-Amidships. J—Unit with jackshaft. U—Unit with engine.

Auxiliary, Location

Not furnished Op-Optional at extra cost. -Amidships.
-Rear of amidships main transmiss -Unit with engine.

UNIVERSAL JOINTS

Blo—Blood Bros. Mach. Co. B-C—Blood and Cleveland. Cle-Cleveland Steel Prod. Corp. Har—Spicer Mfg. Co.
M.M.—Mechanics Machine Cc. PeS-Peters and Spicer. Pet—Peters.
P-S—Peters and Snead.
S-C—Spicer and Cleveland. Spi—Spicer Mfg. Co. S-P—Superior Universal Products Co. SpB-Spicer and Blood Bros. SpP—Spicer and Pick. S-T—Spicer & Thermoid. U-M-Universal Machine Co. U-P-Universal Products Co.

REAR AXLE Make

Clark Equip. Co. Columbia Axie Co. Continental Axie Co -Continental Axie Co, -Eaton Axie Co. -Salisbury Axie Co. -Timken Det. Axie Co. -Wisconsin Axie Co.

Final Drive and Type

Dead. Internal Gear. Double Reduction. Relay—Pendulum Drive. Spiral Bevel. -Worm. Worm. Semi-Floating. Three-Quarter Floating. Full Floating.

Drive and Torque
Radius Rods and Torque Arm
Hotobkiss.
Radius Rods.
Torque Arm.
Torque Tube.
Radius Rods Optional.

WHEELS DRIVEN

orward pair of rear wheels. Front and forward pair of rear wheels. Four rear wheels.

FRONT AXLE Make and Model

Shu—Shuler Axle Co., Inc.
Cla—Clark Equipment Co.
Col—Columbia Axle Co.
Con—Continental Axle Co.
Eat—Eaton Axle Co.
Sal—Salisbury Axle Co.
She—Sheldon. Tim—Timken Det. Axle Co. Wis—Wisconsin Axle Co.

BRAKES—Service Make

Bendix.
—Bendix front, Eaton rear.
—Bendix front, Own rear. C—Columbia.
K—Clark.
L—Lockheed.
LO—Lockheed front, Own rear.
O—Own.
OE—Own front, Eaton rear.
OW—Own front, Wisconsin rear.
S—Steeldraulle.
T—Timken.
W—Wisconsin.
Ws—Westinghouse.

Location

2—Two Wheel.
4—Four Wheel.
6—Six Wheel.
2/4—Two wheel brakes effective on all four wheels through driveshaft.
F—Driveshaft effective on four wheels.
J—Jackshaft.
P-Propeller shaft.
P/4—Propeller shaft.
Fwheels. Four rear wheels.

Type

-Internal.
-Internal front and external rear.
-External.

Method of Operation

Air.
Hydraulic and mechanical.
Hydraulic.
Mechanical.
Vacuum.

BRAKES-Hand Location

of double propeller shaft. vel gear shaft.

Type

-External. -Internal front and external rear.

STEERING GEAR Make

-Columbus G. & P. Co,
-Gemmer Mfg. Co,
-Hannum Mfg. Co,
Saginaw Strering Gear
Div. General Motors Corp.
Hannum Mfg. Co,
Ross Gear & Tool Co,
-Wohlrab Gear Co.

FRAME Type

nannel reinforced with plate. de rails tapered front and rear.

SPRINGS-Auxiliary

Type springs.

4—Quarter elliptic.

C—Coil spring.

Y-Chevrolet utility model with dual 30x5 rear tires lists at \$545.00.

(X) General Motors Trucks. Gross vehicle weight indicated for each model in (A) General Motors Tuckes. Gloss venues weight and material motor and motor than the leist the Straight Rating (combined weight of chassis, body, equipment and payload) for which chassis is designed and guaranteed to satisfactorily operate under average conditions. The size of the tires used does not affect this Straight Rating, but to secure maximum tire mileage it is suggested that the total gross weight be limited to a "recommended gross weight" for each tire equipment (type number) based on tire capacity. Chassis prices vary with wheelbase and tire combinations. The range of "recommended gross weights," type numbers and resulting payload range (assuming nominal body allowance) for each model follow.

Note: Models T-15 to T-60 inclusive, as well as Models TX and WX, are available for Export only as coach chassis.

MODEL	RANGE OF RECOMMENDED GROSS WEIGHTS (LBS.)	TYPE NUMBERS	RANGE OF PAYLOAD (TONS)		
T-11	3800	1001	34		
T-15	4500 to 6500	1501 to 1708	1/2-11/2		
T-17	5500 to 6500	1701 to 1708	1-11/2		
T-19	6500 to 8500	2201 to 2223	11/2-2		
T-25	6800 to 9000	2501 to 2518	11/2-2		
T-26	8500 to 11000	261-1 to 2618-18	2-3		
T-30	10000 to 12500	3201 to 3215	2-3		
TX-1861/2	14000	Export Coach	*****		
WX-185	14500	Export Coach	*****		
T-42	12000 to 15000	4201 to 4212	214-4		
T-44	12000 to 16000	4401 to 4412	3-442		
WX-215	17000	Export Coach			
T-51	16500 to 19000	511-1 to 517-13	4-51/2		
T-55	16500 to 19000	551-1 to 557-13	4-51/2		
T-60	18500 to 22000	6201 to 6218	5-61/2		
T-61	19500 to 22000	611-1 to 619-8	5-61/2		
T-82	19000 to 24000	8201 to 8212	5-7		
T-85	22000 to 26000	851-1 to 858-8	5-7		
T-90	22000 to 28000	9001 to 9007	5 to 71/2		
T-95	28000 to 34000	951-1 to 955-8	71/2-10		
T-96	28000 to 34000	961-1 to 965-8	714-10		